PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY

HELD AT PHILADELPHIA

FOR

PROMOTING USEFUL KNOWLEDGE

Vol. VII

JANUARY 1859 TO JANUARY 1861

PHILADELPHIA
1861

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PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. VII. JANUARY—JUNE, 1859. No. 61.

Stated Meeting, January 7, 1859.

Present, eighteen members.

Dr. GEORGE B. WOOD, President, in the Chair.

The judges and clerks of the annual election, held this day for officers of the Society, reported that the following named members were elected officers of the Society for the ensuing year:—

President.

George B. Wood.

Vice Presidents.

John C. Cresson,
Isaac Lea,
George Sharswood.

Secretaries.

Charles B. Trego,
E. Otis Kendall,
John L. Le Conte,
J. P. Lesley.

Members of the Council, for Three Years.

Isaac Hays,
Robert E. Rogers,
Henry C. Carey,
Robert Bridges.

Curators.

Franklin Peale,
Elias Durand,
Joseph Carson.

Treasurer.

Charles B. Trego.

Dr. Wood, the newly elected President, then took the chair, and expressed his acknowledgments to the Society for the honour conferred upon him.

Letters were read from Capt. W. F. Lynch, U. S. N. dated Philada. Dec. 28, 1858, acknowledging the receipt of notice of his election as a member of the Society;—from Col. J. D. Graham, dated Chicago, Illinois, Dec. 25, 1858, enclosing a donation of fifty dollars to aid in the Society's publications. For this donation the thanks of the Society were directed to be communicated to Col. Graham:—and from John F. Frazer, dated Dec. 30, 1858, resigning his membership in the Society; which letter was laid on the table.

The following donations for the Library were announced:—

Astronomical Journal, No. 119.—*From Dr. B. A. Gould.*

Monthly Notices, Roy. Astron. Soc. XIX. 1.—*From the Society.*

Revue de l'Art Crétienne; Recueil mensuel d'Archéologie religieuse dirigé par M. l'Abbe J. Corblet. Deuxième annee, No. 9. Paris, 1858. 8vo.

Life and Services of John Lyon; The Marbles of Vermont; Two Addresses before the Vermont Hist. Soc. by P. H. White and Al. D. Hagar. (Pamphlet 42 pp.) Burlington, 1858. 8vo.—*From the Society.*

Report in the N. Y. Times, of the Address of Dr. Hays before the N. Y. Geographical Society, Dec. 18, 1858.—*From the Author.*

Report of the Improvement of the Kanawha and Ohio rivers by artificial lakes, by C. Ellet, Jun. C. E. Phil. 1858. 8vo.

Die quinare und vigesimale Zählmethode bei völkern aller welttheile; nebst ausführlicheren bemerkungen über die Zahlwörter Indogermanischen stammes; und einem anhange über Fingernamen. Von Dr. A. F. Pott. (300 pp.) Halle, 1847. 8vo.—*From F. L. O. Röhrig.*

Die grundzüge der Finnischen sprache, mit rücksicht auf den Uralaltaischen sprachstamm. Von H. Kellgren. (100 pp.) Berlin, 1847. 8vo.—*From F. L. O. Röhrig.*

La Hongrie ancienne et moderne; histoire, arts, litterature, monuments; par une société de litterateurs, sous la direction de M. J. Boldenyi. (400 pp.) Paris, 1851. 8vo. with illustrations.—*From F. L. O. Röhrig.*

Journal Acad. N. S. Phila. VI. 1.—*From the Society.*

Amer. Jour. Med. Sciences. Jan. 1859.—*From Blanchard & Lea.*

Medical News and Library. Jan. 1859.—*From Blanchard & Lea.*

Maryland Institute: Book of the XI. Exhibition, 1858.—*From the Institute.*

American Iron Association, Bulletin and Statistics. Philadelphia, 1858. 4to.

Proceedings Amer. Antiq. Soc. Oct. 21, 1858. Boston.—*From the Society.*

Amer. Jour. Sci. and Art. New Haven No. 79.—*From the Editors.*

On motion of Prof. Cresson, the Society proceeded to the nomination of a Librarian, in compliance with Sec. 1, Chap. VIII. of the amended laws of the Society, and Mr. J. P. Lesley was nominated for election to that office: after which, on motion, the nomination was closed.

Pending nominations for membership, Nos. 385, 386 and 387, were read, and the Society was adjourned.

Stated Meeting, January 21, 1859.

Dr. George B. Wood, President, in the Chair.

Present, sixteen members.

The following donations for the Library were announced:—

Quarterly Jour. Lond. Chem. Soc. XLII.—*From the Society.*

Official Army Register for 1859.—*From the War Department.*

African Repository, No. 1. *From the Am. Colonization Society.*

Journal, Franklin Inst. Jan. 1859.—*From the Institute.*

A Key to the Trustees' statement; letters to the majority of the Trustees of the Dudley Observatory; by G. H. Thacher. (126 pp.) Albany, 1858. 8vo.—*From the Author.*

Obs. on the Genus Unio. VI. 2, 1858. 4to.—*From Isaac Lea.*

Eleventh Annual Report of the Regents of the University on the condition of the State Cabinet, &c. Albany, 1859. 8vo.—*From the Board of Regents.*

Seventy-first An. Rep. of the Board of Regents. (384 pp.)—*From the same.*

An. Rep. of the Trustees of the N. Y. State Library. (80 pp.) 1858.

Catalogue of Books on Bibliog. Typog. and Engraving in the N. Y. State Library.

Colonial Doc. Holland Doc. II. (770 pp.) Albany, 1858. 4to.

Account of the remains of a fossil extinct reptile recently discovered at Haddonfield, N. J. (16 pp. from Proc. A. N. S.) Phila. 1859. 8vo.—*From Isaac Lea.*

Twelve Memoirs of M. Jules Bienaymé presented at various times to the French Academy.—*From Mrs. E. Smith.*

Professor Trego laid upon the table a mineral deposite from the hot springs of Munnikurrun, in the immediate vicinity of the eternal snows of the Himalayas, about 300 miles north of Simla, in Upper India. The specimen exhibited was obtained from beneath the boiling water of the springs, in November, 1857, by J. Thomas, M.D., and presented by him to Prof. Trego. The temperature of these hot springs is 196° F. which is above the boiling point of water at that place, it being near 7000 feet above the level of the sea. The rock formation in the vicinity is gneiss and granite, accompanied with occasional layers of chloritic or talcose slate. The specimen laid before the meeting much resembles, in shape and general appearance, a petrified fungus of vegetable growth. The surface of the lower portion and stem is covered with warty excrescences of a black colour, while the flat surface of the top has a smooth coating of a brownish yellow tinge. The interior is composed of delicate, shining yellow fibres, closely aggregated, and generally radiating from the central portion or stem. Dr. R. E. Rogers, upon examination of this mineral deposite, finds the dark coloured coating to be a mixture of the oxides of iron and manganese; the fibrous portion is carbonate of lime coloured by oxide of iron; and the smooth top coating is carbonate of lime with a smaller proportion of oxide of iron.

Dr. R. E. Rogers called the attention of the Society to some facts in electricity, and exhibited an instrument calculated for the development of induced electricity, being a modification of Rumkorff's coil, devised by Ritchie. He described the operation of this instrument in producing primary and secondary currents, and in arresting or absorbing the backward current, so as to allow a free discharge of the forward current; and ex-

plained the effects and inferences to be deduced from the facts mentioned by him.

The list of surviving members of the Society was read. The number on the first of January, 1859, was 383; of whom are resident in the United States 284, and in foreign countries 99.

Mr. J. P. Lesley was elected Librarian for the ensuing year.

The Standing Committees of the Society were appointed, as follows:

Finance; Messrs. Fraley, Justice, J. F. James.

Publication; Dr. Hays,* H. C. Carey,* Dr. Bridges.

Hall; Mr. Peale, Judge King, Prof. Coppée.

Library; Mr. Ord, Dr. Bell, Rev. Dr. Stevens.

The Society proceeded to ballot for candidates for membership.

On motion of Mr. Foulke, it was agreed that a committee of ten members be appointed to consider and report upon the condition of the Society, and whether any and what measures should be adopted to increase its future usefulness. The President was requested to appoint the committee, and announce it at a future meeting.

All other business having been concluded, the ballot box was opened, and the following named gentlemen were declared by the presiding officer to be duly elected members of the Society:—

Oswald Thompson, of Philadelphia.

Edmund C. Evans, M.D. of Chester County, Pennsylvania.

Caspar Wister, M.D. of Philadelphia.

And the Society was adjourned.

* Resigned April 15. T. P. James, Dr. Ed. Hartshorne appointed.

Stated Meeting, February 4, 1859.

Dr. Wood, President, in the Chair.

Present, eighteen members.

Letters were read from the Regents of the University of the State of New York, dated Albany, Jan. 17, 1859, announcing a donation for the Library;—from Col. Graham, dated Chicago, Jan. 31, 1859, enclosing a donation of $33.62, in aid of the Society's publication;—and from Oswald Thompson, dated Jan. 25, 1859; Ed. C. Evans, M.D. dated Highfield, Feb. 1, 1859; and Caspar Wister, dated Jan. 29, 1859, severally acknowledging the receipt of notice of election to membership.

The following donations for the Library were announced:—

Monthly Notices R. Astr. Soc. XIX. 2. London.—*From the Soc.*

Geol. Report, S. W. Branch Pacific R. R. in Missouri by G. C. Swallow. St. Louis, 1859. (100 pp. with a map.) 8vo.—*From G. C. Swallow.*

Philada. Water Works, An. Rep. of Chief Engineer. Philada. Jan. 1859. (50 pp. 2 copies.)—*From City Councils.*

Mr. Fraley announced the decease, at Boston, of the American historian, Wm. H. Prescott, a member of this Society, aged 63 years; and suggested that Mr. Bancroft might perhaps be present at some future meeting, and be induced to deliver a eulogy on the deceased.

Mr. James announced the decease, at Cambridge, Mass. of the American astronomer, Wm. C. Bond, a member of the Society.

The Committee directed at the last meeting to be appointed to consider and report upon the condition of the Society, was named by the President to consist of Mr. Foulke, Dr. F. Bache, Dr. Dunglison, Prof. Cresson, Mr. Lea, Mr. Fraley, Judge King, Dr. R. E. Rogers, Dr. Leidy, Dr. Le Conte, and (on motion of Mr. Foulke) Dr. Bell and Dr. Laroche.

The Librarian presented estimates of the cost of additional shelves to accommodate the books, which, on motion of Dr.

Bell, were referred to the consideration of the Committee on the Hall, with power to act.

Dr. R. E. Rogers exhibited the capacity of the Rumkorff coil (as modified by Ritchie), for generating electricity of high tension and great volume. Dr. Rogers explained, by experiments with a small but powerful electrical machine armed with a wooden ring, in the hollow of which was concealed a solid wire ring (not alluded to by the maker or describers of the machine), how the volume of the common electrical machine can be indefinitely increased, without diminishing the tension, by simply protecting its condenser from the air, which, even in its most favourable conditions, cannot but occupy itself incessantly with carrying off the electricity. Dr. Rogers succeeded in affording such protection to the common condenser by simply making it hollow, and facing the inside instead of the outside with a metallic surface. The same result is obtained by insulating the outside surface by means of a heavy coat of varnish. A silk gown thrown over the operator standing on an insulating stool, makes him a powerful condenser, upon this principle.

Stated Meeting, February 18, 1859.

Prof. Cresson, Vice-President, in the Chair.

Present, thirteen members.

Letters announcing donations for the library were read from the I. R. Geol. Inst. dated Vienna, Nov. 30, 1857, Jan. 10, 1858;—the I. Soc. of Nat. of Moscow, dated June 5–17, 1858;—the R. Sax. Soc. dated Leipsig, April 28, and July 18, 1858:—the U. Hess. S. N. H. dated Giessen, Aug. 6, 1858:—the R. Dan. S. dated Copenhagen July 1, 1858:—the R. A. S. at Amsterdam, dated Dec. 10, 1857, and June 23, 1858: and the scientific commission of the Zool. Gard. of Amsterdam, dated March, 1858.

Letters were also read from the R. A. S. at Amsterdam, acknowledging the receipt of the Society's publications:—from Dr. D. Bierens de Haar, calling the favourable attention of the

Society to his published tables of definite integrals, dated Deventer, March, 1858:—from Wm. H. Miller, F. Sec. of the R. S. dated London, January 19, 1859, relative to the supply of missing numbers of the A. P. Transactions:—from E. Everett, Pres't. Trustees Boston Pub. Lib. dated Boston, Jan. 1859, announcing the presentation of Dr. Bowditch's library to the B. P. L. and requesting a continuation of exchanges.

The following donations for the Library were announced:—

African Repository. XXXV. 2.—*From the Amer. Col. Society.*

Giornale . . . Instituto Lombardo, *f.* xlvii.-liv.—*From the Institute.*

Memorie . . . VI; VII, *f.* i, ii, iii. 1856, 1858.—*From the same.*

Atti . . . . I. R. Is. Lombardo 1, *f.* i–v. Milan, 1858. 4to.—*From the same.*

Bulletin . . . Soc. Imp. Nat. Moscow, 1857, ii-iv, 1858, i.—*From the Society.*

Jahrbuch . . . K. K. Geol. Reich. 1857. VIII. No. 2, 3. 8vo.—*From the Institute.*

Bericht . . . K. Sächs. Gesell. Phil. hist. C. 1856, iii, iv, 1857, i, ii, 1858 i.—Math. phys. C. 1857, ii, iii, 1858, i.—*From the Society.*

Hankel's elektrische untersuchungen, iii. Leipsig.—*From the same.*

Hanson's theorie der sonnenfinsternisse p. 306-451.—*From the same.*

Jahrs. (43d) . . . Nat. Gesell. Emden, 1857. 8vo.—*From the Soc.*

Kleine Schriften . . . N. G. Emden, 1858. V. Small 8vo.—*From the same.*

Bericht (6th.) . . . Oberhess. Gesell. Giessen, 1857.—*From the Soc.*

Obersigt . . . K. Danske V. Sels. For. 1857. Copen.—*From the Soc.*

Catalogue of books . . R. Acad. Amster. I. i, 1857.—*From the Acad.*

Jaarboek . . . R. Acad. Amsterdam, April, 1857—April, 1858.—*From the same.*

Verslagen en Mededeelungen, Letter Kunde III. i, ii, iii, 1858;—Naturkunde VII. i, ii, iii. 8vo.—*From the same.*

Verhandelingen . . IV. V. VI. 1856, 1857, 1858. 4to.—*From the same.*

Bijdragen tot de Dierkunde . . . K. Zool. S. Nat. Artis, vii, 1858.

Boston Public Library, circular to the patrons of the Bowditch Library. Aug. 28, 1858. (Pamphlet 13 pp.) 8vo.—*From the Library.*

Cincinnati Y. Men's Lib. Ass. 24th An. Rep. 1858.—*From the Asso.*

Missouri Geol. Survey, 4th Rep. of progress, 1859.—*From G. C. Swallow.*

California State Register, 1859, edited and presented *by E. G. Langley.*

Franklin Institute Journal. Feb. 1859.—*From the Institute.*

The minutes of the last meeting of the Board and Council were read.

Pending nomination, No. 388 was read.

On motion of Mr. Foulke, the Librarian was instructed to transmit by mail to the members of the Society its proceedings, so soon as published, except in cases where requested not to do so by the parties interested.

On motion of Dr. Le Conte, the letter of resignation of Prof. Frazer was taken from the table and accepted, and the Society was adjourned.

Stated Meeting, March 4, 1859.

Present, twenty-two members.

Dr. Wood, President, in the Chair.

New members were introduced : Dr. Evans by Dr. Bridges ; Judge Thompson by Mr. Fraley ; Dr. Wister by Dr. Le Conte.

A letter was received from Jordan & Brother, of Philadelphia, dated February 28, 1859, enclosing and requesting attention to a letter from the heirs of Joseph Horsfield, of Bethlehem, deceased, reclaiming through their agents, Jordan & Brother, a certain manuscript volume of correspondence relating to Indian Affairs in the last Century, deposited in the library of the A. P. Society by the said Joseph Horsfield, and so described in Vol. I. Part 1, of Historical and Literary Transactions, page 4.

The following donations to the Library were announced:—

Ten pamphlets of Natural History and one of Chimatology, from the proceedings of different societies.—*From Dr. Leidy.*

Monthly Notices . . . R. As. S. xix. iii. Jan. 14, 1857.—*From the Soc.*

Principles of Social Science, by H. C. Carey, III.—*From the Author.*

Reply of B. A. Gould to the Statement of the Trustees of the Dudley Observatory. Albany, 1859, (pamp. 8vo. 366 pp.)—*From the Author.*

First Annual Message of A. Henry, &c. Phila. 1859, (pamp. 172.) —*From the Councils.*

Journal . . . S. Arts and Inst. in Union. London, VI. 280, 284.—*From the Society.*

Proceedings A. N. S. Philada. 1859, i. ii. iii.—*From the Acad.*

Amer. Jour. Sci. and Art. New Haven, March, 1859.—*From the Ed.*

Dr. Leidy presented the following papers, intended for the Transactions, and remarked that they gave an account of the geology, and of the remains of some extinct vertebrata of a small portion of country near the head-waters of the Missouri, in the Territory of Nebraska.

This great territory, embracing upwards of 130,000 square miles, is composed of formations of the Cretaceous and later Tertiary periods, with here and there a protrusion of Metamorphic rocks. Watered by the many western tributaries of the Missouri, almost all of these, so far as they have been explored, have yielded large numbers of species of extinct organic forms, vegetable and animal.

From the Mauvaises Terres of White River, a miocene tertiary freshwater formation, apparently a lacustrine deposit, an immense quantity of fossil bones of extinct mammals and turtles have been collected. In collections made by gentlemen of the Fur Company, by Jesuit Missionaries, by Dr. Hayden; and in others obtained under the auspices of the government, the Smithsonian Institution, and Professor James Hall, altogether forming from 6000 to 8000 lbs. of fossils, submitted to Dr. Leidy's inspection—he had detected the remains of 30 extinct mammals and 1 turtle. Of these there are 10 species of the extinct genera of *ruminants*, Oreodon, Agriochœrus, Poebro-therium, Dorca-therium. Leptauchenia and Protomeryx; 8 species of *pachyderms* of the genera Hyopotamus, Elotherium, Titanotherium, Palæochœrus, Leptochœrus, Hyracodon and Rhinoceros; of *solipeds*, a species of Anchitherium; of *rodents*, 4 species of the genera Chalicomys, Ischyromys, Palæolagus and Eumys; of *carnivora*, 7 species of the genera Hyænodon, Amphicyon, Drepanodon* and Deinictis; and the turtle forms the type of the extinct genus, Stylemys.

*The name Drepanodon, was applied by Nesti, as early as 1826, to the sabretoothed tiger, for which, subsequently, a number of other names have been employed—that of Machairodus of Kaup, being the most familiar. The author of the above remarks applied the name Drepanodon, in 1856, to an extinct reptile or fish, a tooth of which was discovered by Prof. E. Emmons, at Cape Fear, North Carolina. (See Proceedings of Acad. Nat. Sci. Vol. VIII 255.) The author would now substitute the name Lesticodus impar, Leidy, for the animal.

From a later tertiary formation than the one just indicated, and suspected to be of pleiocene age, on the Neobrara river, explored in the recent expedition of Lieut. G. K. Warren to Nebraska, Dr. Hayden, geologist to the expedition, collected a large quantity of fossil bones. These are of especial interest as indicating a fauna more nearly allied to the existing fauna of Asia and Africa than to our own. In the collection submitted to the examination of Dr. Leidy, he detected the remains of 29 mammals and 1 turtle. Of these there are 10 species of *ruminants* of the genera Cervus, Merycodus, Procamelus, Megalomeryx, Merycochœrus and Merychyus; 3 *pachyderms* of the genera Rhinoceros, Mastodon and Elephas; of *solipeds*, 8 species of the genera Equus, Hipparion, Protohippus, Hypohippus, Parahippus and Merychippus; of *rodents*, 2 species of the genera Hystrix and Castor; of *carnivora*, 6 species of the genera Canis, Felis and Aelurodon; and the turtle appears to be a species of Stylemys.

From the green sand formation of the cretaceous period, through which courses the Missouri and its tributaries, the Grand, Moreau and Cheyenne rivers, with a part of White river, the remains of numerous species of mollusks have been obtained. From this formation it was that Maximilian, Prince of Neuwied, obtained the skull and vertebral column of Mososaurus Missouriensis, described by Dr. Goldfusz, and now preserved in the Museum of Bonn. Teeth of sharks and remains of sphyraenoid fishes have also been discovered in the same formation.

From the great lignite basin, an estuary formation of the middle tertiary period, covering many thousand square miles at the upper part of the Missouri river, Dr. Hayden obtained remains of numerous species of plants, mollusks and vertebrates. This basin, and the remains of the vertebrated animals discovered in it, form part of the material of the papers presented to the Society this evening.

The bad lands of the Judith river, a tributary to the head waters of the Missouri, with the vertebrate remains discovered by Dr. Hayden, in those lands, form the other part of the subject matter of the papers just mentioned.

The papers presented by Dr. Leidy, for the Transactions, were entitled: A Geological Sketch of the Estuary and Fresh-water Deposite of the Bad Lands of the Judith, with some remarks upon the surrounding formations, by F. V. Hayden, M.D.; and On extinct Vertebrata from the Judith and Great Lignite Formations of Nebraska, by Joseph Leidy, M.D. Both papers

were referred to a committee consisting of Dr. Le Conte, Mr. Lesley and Dr. Caspar Wister.

Pending nomination No. 388, and new nomination No. 389, were read.

The committee to consider the condition of the Society not being prepared to report, was continued, with leave to report when prepared.

On motion of Dr. Le Conte, the application of the heirs of Joseph Horsfield was referred to the Committee on the Library, with power to act, and the Society was adjourned.

Stated Meeting, March 18, 1859.

Present, twenty-four members.

Dr. Wood, President, in the Chair.

Letters were read from C. C. Rafn, dated Copenhagen, Sept. 3, 1858, expressing the desire of the Royal Society of Northern Antiquarians to address its memoirs and reports to foreign societies;—and from the Lyceum of Nat. Hist., dated New York, March 12, 1859, acknowledging the receipt of the proceedings, Vol. VI. No. 59.

The following donations for the Library were announced:—

Proceedings . . . Mass. Hist. S. in respect to the memory of W. H. Prescott, Feb. 1, 1859. Boston. (53 pp.) 8vo.—*From the Soc.*

Report of Hist. and Progress of Am. Coast Survey, to 1858. By the committee of twenty appointed by the A. A. A. S., August, 1857. (88 pp.) 8vo.

Proceedings Am. Antiq. S. Special Meeting, Feb. 10, 1859.—*From the Society.*

Soc. R. des Antiq. du Nord. List, &c., 1858. (8 pp.) 8vo.—*From the Society.*

Sur la Construction des Salles dites des géants, par S. M. le roi Fréd. de Danemark. Copenha. 1857. (19 pp.) 8vo.—*From the same.*

Cabinet d'Antiq. Amer. a Copenhague, 1858. (60 pp.) 8vo.—*From the same.*

Proceedings . . . Boston N. H. So. VI. 26, 27.—*From the Society.*
Account of the Haddonfield Reptile. (Second copy.)—*From W. P. Foulke.*
Report . . . Penn. Hospital for the Insane, for 1858.—*From Dr. Kirkbride.*
Report (31st) Phila. House of Refuge, for 1858.—*From Board of M.*
Report . . . Penn. Inst. Deaf and Dumb, for 1858.—*From Board of M.*
Franklin Institute Journal. March, 1859.—*From the Institute.*
Medical News and Library. March, 1859. *From Blanchard & Lea.*
African Repository. March, 1859.—*From Amer. Col. Society.*

The committee to which were referred the communications of Dr. Hayden and Dr. Leidy, reported in favour of their publication in the transactions of the Society, and was discharged.

The decease of Dr. Thomas D. Mütter, was announced by Dr. Franklin Bache; a member of this Society, he died at Charleston on the 16th instant, aged 60 years.

The decease of Dr. C. F. Beck was announced by Professor Coppée; a member of the Society, he died at Rome on the 13th of February last.

Dr. Pancoast was appointed to prepare an obituary notice of Dr. Mütter.

Dr. Ruschenberger was appointed to prepare an obituary notice of Dr. Beck.

Dr. Le Conte made some observations on the geographical distribution of animals, with especial reference to the genera and species of insects in North America.

Mr. Lesley referred to the last paragraphs in the paper of Dr. Hayden, presented at the last meeting, and illustrated the wide range of American formations, and the probability of new discoveries of Devonian and Silurian rocks between Utah and the Pacific ocean, by describing what is already known respecting certain extensive beds of iron ore, the rational genesis of which is still, to some extent, a problem. He also exhibited specimens of iron ore from the subcarboniferous redshales of XI in Kingston Hollow, Lycoming county, Pennsylvania, and referred to other localities where the same ore is known to exist.

Pending nominations No. 388 and 389, and new nomination, No. 390, were read.

On motion of Mr. Powel, that a list of members of the Society from its first organization to the present time, be printed, that subject was made the order of business for the next meeting, and the Society was adjourned.

Stated Meeting, April 1, 1859.

Present, twenty-three members.

Prof. Cresson, Vice-President, in the Chair.

A letter was read from the Secretary of the American Association for the Advancement of Science, dated Cambridge, March 26, 1859, informing the Librarian of the transmission of a copy of its proceedings, with other copies for other parties.

The following donations for the Library were announced:—

Proceedings A. N. S. Philadelphia, 1859; 5, 6, 7.—*From the Soc.*

Astronomical Journal, No. 120.—*From Dr. A. B. Gould.*

Trans. Batav. Soc. XXVI. 1854-1857. (132 pp.) 4to.—*From the Society.*

Journal B. S. for Indian Know. VI., i. iii. iv. v. vi.—*From the same.*

5th Opgave van Boekwerken . . . p. 107–198. 8vo.—*From the same.*

Proceed. R. Geog. Soc. II., i. ii. 1858, London.—*From the Society.*

Val. Address by H. H. Smith, M.D. Phila. 1859.—*From the G. Class.*

Address before the Alumni, by H. H. Smith, M.D.—*From the Author.*

11th An. Rept. Mass. School for Idiots. Cambridge, 1859.—*From the Trustees.*

27th An. Rept. Perkins Inst. and Mass. Asy. for the Blind.—*From the Trustees.*

Quar. Jour. Chemical Soc. XLIV. Lond. Jan. 1859.—*From the Soc.*

Proceed. A. A. A. S. Baltimore meeting. Cambridge, 1859.—*From the Association.*

Month. Not. R. Astro. Soc. XIX., 4. Feb. 1859.—*From the Soc.*

History of St. Louis. (pp. 47.) 1854. 8vo.—*From Dr. Leidy.*

Map and Section of the Missouri river, by F. V. Hayden. Philada. 1857. (40 pp.) 8vo.—*From the same.*

Description of Koch's Hydrachon. New Orleans, 1853. (12 pp.) —*From the same.*

Amer. Journ. Med. Sci. LXXVI. Philada. April, 1859.—*From Blanchard & Lea.*

Medical News and Library. XVII. 196, for April, 1859.—*From Blanchard & Lea.*

Mr. Durand presented for publication in the Transactions, a paper entitled "A Sketch of the Botany of the Basin of Great Salt Lake of Utah;" and read the preface to it. The paper was referred to a committee consisting of Dr. Bridges, Dr. Wood and Dr. Carson.

Mr. Powel exhibited some photographs of the moon, executed by Lubis M. Rutherford, of New York, enlarged from small photographs taken, by means of a powerful telescope, on collodion; also two stereoscopic views, copied from originals, and a fine example of a photograph taken on dry collodion, after the Fothergill process.

Pending nominations Nos. 388, 389 and 390, were read.

The special order of business for the evening being called up, to wit:—the motion of Mr. Powell, that a list of members of the Society, from its first organization to the present time, be printed—it was, on motion of Dr. Bell, adopted; and, on motion of Mr. Fraley, the form and number of copies to be printed were referred to the secretaries, to report thereon at the next meeting.

No. 60, of the Proceedings just published, was laid on the table, and the Society was adjourned.

Stated Meeting, April 15, 1859.

Present, twenty-five members.

Dr. Wood, President, in the Chair.

Letters were read, acknowledging the receipt of No. 60 of the Proceedings, from the trustees of the Boston Atheneum, dated Boston, April 6, 1859; The Corporation of Harvard College, dated Cambridge, April 1, 1859; The Connecticut Historical Society, dated Hartford, March 31, 1859.

A letter was read, announcing a donation for the Library, from the Smithsonian Institution, dated Washington, March 18, 1859.

A letter was read from G. A. Matile, consul of Belgium, dated New York, April 11, 1859, requesting to know if there were missing numbers of the publications of the R. Acad. which he could supply from copies in his possession.

The following donations for the Library were announced: —

Proceedings R. Geog. Soc. London. III. 1. 1859.—*From the Soc.*

An. Report, Leeds Phil. and L. S., 38th. 1857-8.—*From the Soc.*

Proc. West Riding Geol. and P. S., 1857-8. Leeds.—*From the Soc.*

Sensorial Vision, by Sir J. F. W. Herschel. Leeds. (16 pp.) 8vo. —*From the same.*

Comets . . . by Christ. Kemplay. Leeds, 1859. (118 pp.) 8vo. —*From the Author.*

China and its Trade, by J. Crawford. London, 1858. (24 pp.) 8vo. —*From the Author.*

African Repository. April, 1859.—*From Am. Col. Society.*

Pacific Ex. Ex. Vol. IX. Senate Doc. 13, pt. 9. Wash. 1858.— *From U. S. Government.*

Same, published as an Executive Document.—*From U. S. Gov.*

Smithson. Cont. to Knowledge. Vol. X. Wash.—*From the Inst.*

Soiling of Cattle, &c., by Jos. Quincy. Boston, 1859. (64 pp.) 8vo.—*From the Author.*

Scarlet Fever, by C. Morris, M.D. Phil. 1858. (190 pp.) 8vo.— *From the Author.*

Dr. Bridges, chairman of the committee to which the paper of Mr. Durand was referred, reported a recommendation that the paper be published; and on motion of Dr. Bache, it was ordered to be printed, and the committee was discharged.

The decease of Robert Walsh, a member of the Society, at Paris, on the 7th February last, aged 76 years, was announced by Dr. F. Bache.

Mr. Lesley called attention to the notice of two violent storms, in the diary of the Plymouth Colonists, in 1620, as occurring at an interval of fourteen days; and suggested that a search into such early records of the weather of the Atlantic coast, would probably furnish sufficient evidence of the con-

stancy, two centuries ago, of those conditions which produce the regular weekly storms of the present day.

Pending nominations Nos. 388, 389, 390, were read, and the candidates balloted for.

The Board of Secretaries, to which was referred the subject of printing the list of members, reported progress; and on motion of Dr. Bache, was continued in committee, with directions to report at the next meeting.

M. Matile's communication was, on motion of Mr. Fraley, referred to the Librarian to take order.

Dr. Hays and Mr. Carey offered their resignations as members of the Publication Committee, which were accepted; and Mr. T. P. James and Dr. Edw. Hartshorne were chosen to fill the vacancies: Dr. Bridges remaining chairman of the commitee.

The ballot box was now, on motion of Dr. Hays, declared closed, and Judge WALTER H. LOWRIE, of Pittsburg, Mr. Wm. S. VAUX, of Philadelphia, and Capt. Wm. R. PALMER, of the U. S. Coast Survey, were declared duly elected members, and the Society was adjourned.

Stated Meeting, May 6, 1859.

Present, seventeen members.

Dr. WOOD, President, in the Chair.

Letters were read, acknowledging receipt of notice of their election, from Judge W. H. Lowrie, dated Pittsburg, April 20, 1859; Wm. S. Vaux, Esq. dated Philada. April 30, 1859; and Capt. Wm. R. Palmer, dated Washington, April 19, 1859.

A letter was read from the Librarian of the Royal Library, dated at the Hague, Dec. 14, 1858, acknowledging the receipt of Part 1, Vol. XI. of the Transactions.

The following donations for the Library were announced:—

Trans. Mass. Agri. Soc. N. Ser. I. Boston, 1858.—*From the Soc.*
Proc. Mass. Hist. Soc. 1855–1858. Boston.—*From the Society.*

Proc. Boston Soc. Nat. Hist. Vol. VII. 1, 2.—*From the Society.*
Proc. Acad. Nat. Sci. Philada. 1859, 7, 8.—*From the Academy.*
Cat. officers and students Mich. Univers. 1859.—*From the Univers.*
Synopsis of the Ingham Univ. Leroy, N. Y. 1858.—*From the Univ.*
Phila. Fem. Med. Col. 8th An. Announcement.—*From the College.*
Valedictory Address, by Anne Preston, M.D. 1859.—*From the Col.*
Introductory Lecture by E. H. Cleveland, M.D.—*From the College.*
Almanaque náutico para 1860, San Fernando.—*From the Observ.*
Researches into the Phen. of Respiration, by E. Smith. Lond. 1859.
Astronom. Journal No. 122. Cambridge.—*From Dr. B. A. Gould.*
Address to Brit. Assoc. by R. Owen, M.D. 28th An. Assembly.
Traité l'Amaurose, par Ch. Deval. Paris, 1851 (450 pages). And Abhandlung über die Amaurose, übertragen von Dr. Jacob Herzfelder. Leipsig, 1853. (220 pp.) 8vo.—*From Dr. Roehrig.*
Geology of Pennsylvania. Vol. II.—*From the Sec. of Commonw.*
Preliminary chart of New York bay and harbour, signed W. R. Palmer, 1859.—*From Coast Survey.*

On motion of Dr. Dunglison, the Secretary was directed to give notice to members appointed to prepare obituary notices prior to the present year, that it is desirable that the duty should be attended to.

New nomination, No. 391, was read.

The Secretaries made a report in relation to the printing of the list of members of the Society, which was adopted:—that the most useful form for printing the list would be as it exists in the MSS. list belonging to the Society, with the addition of an alphabetical index, and of the size and form of the Proceedings.

The special committee appointed to consider and report upon the condition of the Society, and the means of increasing its usefulness, presented their report, and recommended certain resolutions to be passed, which, together with the proposed amendments of the laws of the Society, were postponed for consideration and discussion at the next stated meeting, and ordered to be printed for the use of the members.

The following named members were appointed a committee to co-operate with Dr. I. I. Hays, in further Arctic exploration—Mr. W. P. Foulke, Dr. R. E. Rogers, Mr. Isaac Lea,

Dr. J. L. Le Conte, Prof. E. O. Kendall, Mr. J. P. Lesley, Rev. Albert Barnes, Judge Ed. King, Prof. J. C. Cresson.

The Committee on the sale of the Hall received, on motion of Mr. Fraley, four additional members—Prof. Fairman Rogers, Dr. Isaac Hays, Prof. J. C. Cresson, and Mr. W. P. Foulke.

A communication from the Actuary of the Franklin Institute, to be supplied with certain of the Society's publications, was referred to the Librarian, with power to act; and the Society was adjourned.

Stated Meeting, May 20, 1859.

Present, sixteen members.

Prof. Cresson, Vice-President, in the Chair.

Letters were read, acknowledging the receipt of the Society's publications, from the R. Prussian Acad. at Berlin, dated Aug. 12, 1858; the Agric. Soc. at Berlin, dated Nov. 18, 1858; the R. Acad. at Amsterdam, dated Dec. 20, 1858; the Im. Inst. of France, dated Dec. 9, 1858; the R. Acad. at Munich, dated Dec. 28, 1858; and the R. Acad. at Stockholm, dated Nov. 15, 1858. Letters were read, giving notice of donations for the Library, from the Cambridge Phil. Soc. dated Nov. 1858; the Agr. Soc. Berlin, Nov. 18; the R. Acad. Berlin, Aug. 18; the R. Acad. Stockholm, Nov. 15; the R. Acad. Munich, Dec. 28, 1858; and the Hon. W. H. Lowrie, dated Pittsburg, May 6, 1859.

The following donations for the Library were announced:—

Am. Jour. Sci. No. 81. New Haven, May, 1859.—*From Editor.*
Med. News and Lib. No. 197. Phila. May, 1859.—*From the Publ.*
Annals N. Y. Lyceum, Nos. 10–13, Sep. 1858.—*From the Lyceum.*
Monthly Not. R. A. S. London, XIX. April, 1859.—*From the Soc.*
Compte Rendu de l'Ac. Im. St. Petersburg, 1857.—*From the Acad.*
Zeitschrift für die gesamm. Nat. XI. Berlin, 1858. 8vo.—*From N. H. S. at Halle.*

Verhand. Ver. Gartenbaues. IV. 3; V. 1, 2. Berlin, 1857, 1858. —*From the Society.*

Jahrbuch K. K. Geol. Reich. VIII. 4. Vienna, 1857.—*From the Inst.*

Monatsbericht K. Prus. A. Sep. 1857—June, 1858. Berlin.—*From the Academy.*

Abhandlungen K. Prus. Akad. for 1857. 4to.—*From the same.*

K. Svenska V. A. Handlingar. Första b. andra h. 1856.—*From the Academy.*

Ofversigt K. S. V. A. Förhandlingar, 1857. Stock.—*From the same.*

Berättelse . . Fysik . . 1852 . . . af E. Edling. Stock.—*From the same.*

Voyage autour du monde sur l'Eugenie, Physique I.—*From the same.*

Same in Swedish, Fysik I. Bot. I. Zool. I. II. Stockholm. 4to.—*From the same.*

Trans. Cambridge Phil. Soc. X. 1, 1858. 4to.—*From the Society.*

Memoirs Lit. Phil. S. Manchester, XV. 1, 1858.—*From the Soc.*

Proceedings Lit. Phil. S. Man. No. 1–14, 1857.—*From the same.*

Proceedings R. Geog. S. London. Vol. II. No. 6.—*From the Soc.*

Journal R. Dublin Soc. XI. October, 1858.—*From the Society.*

Notices of Proc. R. Inst. of Great Britain, VIII. Nov. 1857–July, 1858.—*From the Institute.*

List of Members of the same for 1857, &c.—*From the same.*

Jour. Soc. Arts, Man. and Com. London.—*From the Society.*

Franklin Inst. Jour. No. 401, May. Philada.—*From the Institute.*

African Repository for May, 1859.—*From the Amer. Col. Society.*

Proceedings Acad. N. S. Philada. 9, 10.—*From the Academy.*

Astronom. Journal, No. 123. Cambridge.—*From Dr. B. A. Gould.*

Report of Sup't. of Coast Survey, for 1857. 4to.—*From the Sup't.*

The death of Baron Von Humboldt was announced, with appropriate remarks, by Dr. Franklin Bache. Baron Von Humboldt was elected a member of this Society, July 20, 1804, and died at Berlin, May 7, 1859, aged 89.

The death of Alexis de Tocqueville, elected a member of the Society, January 21, 1842, was announced by Dr. F. Bache.

The minutes of the last meeting of the Board of Officers and Council were read.

Pending nomination, No. 391, was read.

Dr. Franklin Bache presented a report, in part, in behalf of the Committee on the Franklin Manuscripts, appointed Dec. 7, 1849, which was accepted, and the resolutions contained therein adopted.

On motion of Mr. Fraley, and owing to the absence, through sickness, of the chairman of the committee on the condition of the Society, the discussion of the alterations in the Laws and Regulations, proposed by the committee, was again postponed to the next meeting.

The resolutions of Council, relating to the Magellanic premium, implying an alteration of the by-laws, they were laid upon the table for consideration at the next meeting; and, on motion of Mr. Fraley, were ordered to be printed for the use of the members.

Stated Meeting, June 17, 1859.

Present, thirteen members.

Judge SHARSWOOD, Vice-President, in the Chair.

Letters were received, acknowledging the receipt of Nos. 57, 58 of the Proceedings, from the Society of Antiquaries, dated London, May 20, 1859; and announcing a donation for the Library, from the Royal Observatory, dated Greenwich, May 12, 1859.

The following donations for the Library were announced:—

Astronomical Jour. No. 124, 125. Cambridge.—*From Dr. Gould.*

Journ. Soc. Arts, Man. and Com. No. 324–331. London.—*From the Society.*

Contrib. to Palæontol. New York, by J. Hall. (16 pp.) 1855-58. *From the Author.*

Report, Geol. Survey, Iowa. I. H. Hall & Whitney.—*From J. Hall.*

Reports of Explorations . . . Pacific Ocean. X. Senate Document. *From U. S. Government.*

Med. News and Library. No. 198. Philada. June, 1859.—*From Blanchard & Lea.*

Quar. Jour. Chem. Soc. London. XLV.—*From the Society.*

Franklin Institute Journal. No. 6. 1859.—*From the Inst.*

Annals des Mines, liv. 1–5. 1858. Paris.—*From I. School of M.*

African Repository. No. 6. June, 1859.—*From Am. Col. Soc.*

Proceedings Amer. Antiq. Soc. April, 1859. Boston.—*From the Soc.*

Medical Heroism, an Address by J. Bell, M.D. Phila. 1859.—*From the Author.*

Report of Committee on the Internal Hygiene of Cities, appointed by the Quarantine Convention at Baltimore, April, 1858.—*From Dr. Bell.*

The death of Charles Robert Leslie, the artist, elected a member of this Society, April 21, 1836, was announced by Dr. Le Conte. He died at London, May 5, 1859, aged 65 years.

Mr. Justice described a superior microscope stand made by Mr. Zentmeyer, of Philadelphia, for and under the direction of Dr. Hunt, of Philadelphia, and embracing all the important late improvements. Dr. Le Conte added his testimony to the admirable skill of the mechanician, and supported it by refering to the stand lately made by him for Dr. Goddard, and to the stand now making for the Academy of Natural Science, which promises to be one of the best extant.

Pending nomination, No. 391, was read.

Deferred business being taken up, and the reading of the resolutions appended to the report of the committee on the condition of the Society being called for, the chair decided that the present meeting not being competent to act upon the resolutions, for want of the number required to be present by the Charter, was, therefore, not competent to discuss them by entertaining motions.

On motion of Prof. Cresson, certain amendments to the by-laws, offered by Mr. Fraley as a substitute for, was ordered to be printed with the amendments offered by the Officers and Council, and by the committee on the condition of the Society.

On motion of Mr. Foulke, the consideration of the amendments was postponed until the first stated meeting in October.

On motion of Prof. Cresson, the last motion was ordered to be attached to the printed amendments.

Dr. Coates was permitted, nunc pro tunc, to read a retrospective notice of John Reynell, one of the original members of the Society, with a request that it be not printed, at present, in the proceedings. On motion of Dr. F. Bache, it was, therefore, ordered to be placed among the notices of deceased members; and the Society was adjourned.

Stated Meeting, July 15, 1859.

Present, six members.

Dr. Franklin Bache, in the Chair.

Letters were read, acknowledging the receipt of Nos. 57, 58 of the Proceedings, from the Natural Hist. Society, Northumberland, dated Newcastle, May 5, 1859; the Batavian Society, dated Rotterdam, March 7, 1859; the R. Saxon Society, dated Leipsig, Feb. 14, 1859;—and a letter acknowledging the receipt of Transactions, Vol. II. III. IX. 3, from the Franklin Institute, dated Philadelphia, June 16, 1859.

Letters were read, announcing the transmission of donations for the Library, from the Upper Hessia Society, dated Giessen, March 30, 1859; the Central Phys. Observatory, dated St. Petersburg, Dec. 29, 1859; the Russian Corps of Engineers, dated St. Petersburg, March 1–13, 1859; Elia Lombardini, dated Milan, April 13, 1858, and C. F. Loosey, Austrian Consul at New York, dated July 2, 1859.

A letter was read from Isaac Hazlehurst, Esq., dated Phila. June 22, 1859, resigning his membership in this Society.

The following donations for the Library were announced:—

Proc. Boston N. H. S. VII. 3, 4. Index, &c.—*From the Society.*
Radcliff Obs. XVIII. 1857. Oxford, 1859.—*From the R. Trustees.*
Proc. Amer. Acad. IV. p. 89–248. Boston.—*From the Acad.*
Memoirs Amer. Acad. VI. 2. Boston.—*From the same.*
Am. Journ. Sci. and Arts, July, 1859. N. Haven.—*From the Eds.*
Franklin Institute Journal, July, 1859. Philada.—*From the Inst.*
Amer. J. Med. Sciences, July, 1859. Phila.—*From Blanchard & L.*
Medical News and Lib. July, 1859. Phila.—*From Blanchard & L.*
Proc. Elliott Soc. N. H. I. 1853-'58. Charleston.—*From the Soc.*
African Repository for July, 1859. Wash.—*From A. Col. Society.*
Concord Asylum for Insane. Report, June, 1859.—*From the Trus.*
Proc. R. Geog. Soc. London. Vol. III. No. 2.—*From the Soc.*
Monthly Not. R. Ast. Soc. London. XIX. No. 7.—*From the Soc.*
Trans. Amer. Inst. New York, 1853-'57. Albany. 8vo.—*From the Inst.*
Astrm. Jour. No. 121. Albany. Index to V.—*From Dr. Gould.*

Greenwich A. M. & M. Obs. 1857. London, 1859.—*From the Board of Admiralty.*

Upperhessia S. N. H. and M. 7th Account. Giessen, 1859.—*From the Society.*

En Vandring gjennern Jægerspriis's have og Lund; published by the R. N. Antiq. Soc. Copenhagen, 1858. (40 pp.)—*From the Soc.*

Gelehrte Anzeigen. 46, 47. Münich.—*From the Academy.*

Festival Oration over J. Müller, and his relation to the present Standpoint of Physiology, by Th. L. W. Bischoff. Münich, 1858.—*From the same.*

Oration on the Historical Stages preceding the New Philosophy of Law, by Carl Prantl. München, 1858.—*From the same.*

Contributions I. R. Geog. Soc. 1858. Parts 2, 3. Vienna.—*From the Society.*

Jahrbuch I. R. Geol. Institute, 1858. Parts 1, 2, 3.—*From the Inst.*

Memoirs I. R. Inst. Lombardy. VII. 4, 5, 6. Milan.—*From the Inst.*

Atti I. R. Inst. Lombardy. I. 6, 7, 8, 9, 10.—*From the Inst.*

Compte-rendu Cent. Phys. Obs. 1856. St. Petersburg, 1857.—*From the Ad. Mines.*

Annals of the Observatory. 1855, 1, 2.—*From the same.*

On the French Inundations: a Memoir by E. Lombardini, (in Italian, 110 pp.) Milan, 1858. 4to.—*From the Author.*

On the Changes of the Po, in the district of Ferrara: a Memoir by E. Lombardini. (50 pp.) Milan, 1852. 8vo.—*From the Author.*

On the Importance of Studying the Statistics of Rivers: a Memoir by E. Lombardini. (35 pp.) Milan. 8vo.—*From the Author.*

Other Observations on the Po, by E. L. Milan, 1843.—*From the Author.*

Intorno all sistema idraulico del Po, &c., by E. L. 1840.

Astronomical Notices, No. 7. June 13, 1859. Albany.—*From F. Brünnow.*

Letters from Col. Graham, of Chicago, dated June 20, 1859, were read, accompanying the following communication intended for the Proceedings, and entitled:—

CONTRIBUTIONS TO GEOGRAPHY, No. 3.

On the Latityde and Longitude of eighteen additional positions in the North and North-west of the United States. Also a review of two positions (II. and VI.) *previously reported. From astronomical observations, by Lieut. Colonel J. D. Graham, U. S. Corps of Topographical Engineers.*

Chicago, Illinois, June, 1859.

To the American Philosophical Society, Philadelphia.

I wish now to offer a third contribution to the geography of the United States, for publication in the Proceedings of the Society, if deemed acceptable.

I will indicate the positions by a continuation from the numbers used in the preceding contribution, (No. 2,) published at pp. 352 to 388, of Vol. VI. of the Proceedings. They are as follows, viz:—

VII. ASHTABULA, OHIO.
VIII. ERIE, PENNSYLVANIA.
IX. TOLEDO, OHIO.
X. PRAIRIE DU CHIEN, WISCONSIN.
XI. DUNLEITH, ILLINOIS.
XII. DUBUQUE, IOWA.
XIII. FULTON, ILLINOIS.
XIV. LYONS, IOWA.
XV. ALBANY, ILLINOIS.
XVI. CAMANCHE, IOWA.
XVII. CITY OF ROCK ISLAND, ILLINOIS.
XVIII. FORT ARMSTRONG, ILLINOIS.
XIX. DAVENPORT, IOWA.
XX. NEW BUFFALO, MICHIGAN.
XXI. NILES, MICHIGAN.
XXII. ELYRIA, OHIO.
XXIII. CLEVELAND, OHIO.
XXIV. COLUMBUS, OHIO.

I wish, also, to offer a review, for the purpose of verification, of the following positions previously reported, viz:—

II. MICHIGAN CITY, INDIANA.
VI. MADISON, THE CAPITAL OF WISCONSIN.

The instruments used in making the observations were the same as previously used, and described in page 353 of Vol. VI. of the Society's Proceedings. The system of observation was also the same as was described in the previous papers published in that volume.

The apparent Right Ascensions and Declinations of the stars observed on, were taken from the British Nautical Almanac, except a few whose apparent places are not given in that Ephemeris. The exceptions are as follows, in relation to which the apparent places were taken from the *Connaissance des Temps*, namely:

β Andromedæ
ε Herculis
β Cygni
γ Cygni

For the determination of the longitudes, now reported, two meridians of comparison were used, namely:—I. Chicago. IX. Toledo, Ohio, after its longitude was derived from chronometric comparisons, by means of the electric telegraph, with the meridian of Chicago.

The *time-observations* at Chicago, and the observations both for the *time* and the *latitude* at those stations whose longitudes are based upon direct connections with the meridian of Chicago, will first be given. Then the same will be done in regard to the *time-observations* at Toledo, and the observations at those stations whose longitudes are derived from direct connections with the meridian of Toledo.

Finally, the observations will be given that were made for verifying the positions of Michigan City, Indiana, and Madison, the Capital of Wisconsin.

The position of the observing station at Chicago, will be shown by reference to the table at page 351 of Vol. VI. of the Society's Proceedings.

Observations for the Time at Chicago.

1*st*. 1858, *July 26th*. *At Chicago Observing Station No.* 3, *in latitude* 41° 53′ 46″.3 *N.: longitude* 5*h*. 50*m*. 31*s*.2 *W. of Greenwich*.

Sidereal chronometer No. 2557, fast:

	h. *m*. *s*.
By 17 observations on α Coronæ Borealis, west (at 19*h*. 22*m*. sidereal) - - - -	1 02 50.25
By 23 observations on α Andromedæ, east (at 20*h*. 08*m*. sidereal) - - - -	1 02 50.63
Result—Chronometer No. 2557, fast of sidereal time for this station (at 19*h*. 45*m*. sidereal) -	+ 1 02 50.44
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 11*h*. 26*m*. mean time) - - - -	— 4 38.17

2*d.* 1858, *August* 4*th.* *At the same Station.*

Sidereal chronometer No. 2557, fast:		
By 8 observations on α Coronæ Borealis, west (at 19*h.* 16*m.*) using horizon roof No. 1,	*h. m. s.* 1 03 47.53	
By 9 observations on α Andromedæ, east (at 20*h.* 12*m.*) using, also, horizon roof No. 1,	1 03 46.19	
By E. and W. stars (at 19*h.* 44*m.*) with horizon roof No. 1,	+ 1 03 46.86	*h. m. s.* + 1 03 46.86
By 8 observations on α Coronæ Borealis, W. (at 19*h.* 30*m.*) using horizon roof No. 2,	1 03 46.78	
By 9 observations on α Andromedæ, E. (at 19*h.* 56*m.*) using, also, horizon roof No. 2,	1 03 46.57	
By E. and W. stars (at 19*h.* 43*m.*) with horizon roof No. 2,	1 03 46.68	+ 1 03 46.68
Result--Chronometer No. 2557, fast of sidereal time for this station (at 19*h.* 43*m.* 30*s.*) by 16 observations on α Coronæ Borealis, west; and 18 observations on α Andromedæ, east		+ 1 03 46.77
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h.* 50*m.* mean time)		— 4 31.95

3*d.* 1858, *August* 12*th.* *At the same Station.* 1*st Determination—By East and West Stars.*

Sidereal chronometer No. 2557, fast:	
By 15 observations on α Coronæ Borealis, W. (at 19*h.* 33*m.*)	*h. m. s.* 1 04 31.26
By 15 observations on α Andromedæ, E. (at 19*h.* 55*m.*)	1 04 31.58

1st Result. By E. and W. Stars—Chronometer No. 2557, fast of sidereal time at this station (at 19*h*. 44*m*.) - - - - - + 1 04 31.42

2d Determination. By equal altitudes of α Cygni, observed East and West. August 12th.

Observed double altitudes, E and W., corrected for index error of the Sextant.	Times by Sidereal Chronometer No. 2557. Observed East. (*a*)	Observed West. (*b*)	Half sums of times E. and W. $\left(\frac{a+b}{2}\right)$	Apparent A. R., or sidereal time of meridian transit of α Cygni.	Chron. No. 2557, fast of sidereal time at meridian transit of α Cygni, by each pair of equal altitudes.
° ′ ″	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.
111 41 00	18 31 11.8	24 51 07.9	21 41 09.85	20 36 38.43	1 04 31.42
112 30 10	18 33 33	24 48 46.8	,, ,, 09.90	,, ,,	,, ,, 31.47
113 29 35	18 36 25.6	24 45 55.7	,, ,, 10.65	,, ,,	,, ,, 32.22
114 43 55	18 39 59.5	24 42 21.4	,, ,, 10.45	,, ,,	,, ,, 32.02
117 21 10	18 47 30.3	24 34 49.6	,, ,, 09 95	,, ,,	,, ,, 31.52
119 07 45	18 52 34.9	24 29 46.3	,, ,, 10.60	,, ,,	,, ,, 32.17
120 30 10	18 56 31.2	24 25 48	,, ,, 09.60	,, ,,	,, ,, 31.17
121 03 35	18 58 04.6	24 24 14.2	,, ,, 09.40	,, ,,	,, ,, 30.97
121 52 05	19 00 24.4	24 21 56.7	,, ,, 10.55	,, ,,	,, ,, 32.12
123 21 10	19 04 38.4	24 17 41	,, ,, 09.70	,, ,,	,, ,, 31 27
124 00 10	19 06 29.1	24 15 50.2	,, ,, 09.65	,, ,,	,, ,, 31.22
124 52 10	19 08 56.5	24 13 22.5	,, ,, 09.50	,, ,,	,, ,, 31.07
125 22 30	19 10 23.1	24 11 56.5	,, ,, 09.80	,, ,,	,, ,, 31.37
126 08 00	19 12 31.9	24 09 49	,, ,, 10.45	,, ,,	,, ,, 32.02

2d Result. By 14 pairs of equal altitudes of α Cygni:—Chronometer No. 2557, fast of sidereal time for this station (at 20*h*. 36*m*. 38.43*s*. sidereal time) - - - - - *h*. *m*. *s*. + 1 04 31.57

1st Result, as above, by E. and W. Stars (at 19*h*. 44*m*.) - - - - - + 1 04 31.42

Mean, or Result adopted.—Chronometer No. 2557, fast of sidereal time for this station, August 12th, 1858 (at 20*h*. 10*m*. sidereal) - - - + 1 04 31.49

By comparison—Chronometer No. 141, was slow of mean solar time the same night (at 10*h*. 45*m*. mean time) - - - - - — 4 28.31

4th. 1858, *August* 15*th. At the same Station.* 1*st Determination—By East and West Stars.*

Sidereal chronometer No. 2557, fast:

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 12 observations on α Coronæ Borealis, west (at 19*h.* 04*m.*)	1	04	48.20			
By 21 observations on α Andromedæ, east (at 20*h.* 36*m.*)	1	04	48.51			
1*st Result*—By E. and W. Stars (at 19*h.* 50*m.*)				+ 1	04	48.35

2d Determination—By equal altitudes.

				h.	*m.*	*s.*
By 9 pairs of equal altitudes of α Cygni, observed East and West (at 20*h.* 36*m.* 38.42*s.*)				+ 1	04	48.36
Mean, or Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 20*h.* 13*m.* sidereal) this night,				+ 1	04	48.35
By comparison—Chronometer No. 141, was slow of mean solar time this night (at 10*h.* 13*m.* m. t.)				— 4	28.78.	

5th. 1859, *February* 20*th. At the same Station.*

Sidereal chronometer No. 2557, fast:

1st Set.

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 13 observations on β Geminorum, east (at 4*h.* 33*m.*)	1	26	04.08			
By 13 observations on β Andromedæ, west (at 4*h.* 56*m.*)	1	26	03.84			
1*st Result*—Chronometer No. 2557, fast (at 4*h.* 43*m.*)				+ 1	26	03.96

2d Set.

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 14 observations on α Arietis, west (at 6*h.* 05*m.*)	1	26	04.46			
By 12 observations on γ Leonis, east (at 6*h.* 29*m.*)	1	26	04.25			
2*d Result*—Chronometer No. 2557, fast (at 6*h.* 17*m.*)				+ 1	26	04.35

	h.	m.	s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 5*h*. 30*m*.)	+ 1	26	04.15
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 7*h*. 28*m*. mean time)	— 4	41.29	

6*th*. 1859, *February* 23*d*. *At the same Station.*

Sidereal chronometer No. 2557, fast:	h.	m.	s.
By 9 observations on Arcturus, (α Bootis,) east (at 10*h*. 09*m*.)	1	26	20.55
By 5 observations on β Geminorum, west (at 10*h*. 59*m*.)	1	26	20.66
Result—Chronometer No. 2557, fast of sidereal time for this station (at 10*h*. 34*m*.)	1	26	20.60
By comparison—Chronometer No. 141 was slow of mean solar time for this station (at 12*h*. 20*m*. mean time)	— 4	43.68	

This night was not very favorable for observation. It was cloudy, with a few spots of clear sky, within which the only time-stars that were visible were Arcturus and β Geminorum. They do not match very well in Declination,—that of the former being 19° 55′, and that of the latter 28° 22′, both North. As the latitude of the station is well determined, however, there is probably very little error in the deduced *time* from that cause. But there was a very strong wind, which made it difficult to hold the sextant as steady as was desirable for close work. As the *time* deduced affects the accuracy of the longitude of Dunleith, Illinois, herein reported, we will endeavour to verify the result by another series of observations, whenever an opportunity shall occur. We do not apprehend that the error will be found to exceed a fraction of a second of time.

7*th*. 1859, *February* 27*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:	h.	m.	s.
By 10 observations on α Arietis, west (at 5*h*. 50*m*.)	1	26	45.42
By 13 observations on γ′ Leonis, east (at 6*h*. 24*m*.)	1	26	45.74

	h.	m.	s.
Result—Chronometer No. 2557, fast of sidereal time for this station (at 6*h*. 07*m*.) - - -	+ 1	26	45.58
By comparison—Chronometer No. 141 was slow of mean solar time for this station (at 7*h*. 38*m*. mean time) - - - - -	— 4	43.48	

8*th*. 1859, *March* 4*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:	h.	m.	s.
By 10 observations on β Tauri, west (at 9*h*. 33*m*.)	1	27	15.26
By 12 observations on α Bootis, east (at 10*h*. 07*m*.)	1	27	15.71
Result—Chronometer No. 2557, fast of sidereal time for this station (at 9*h*. 50*m*.) - - -	+ 1	27	15.48
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 11*h*. 00*m*. mean time) - - - - -	— 4	43.52	

9*th*. 1859, *March* 8*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	m.	s.
By 8 observations on α Arietis, west (at 6*h*. 04*m*. 38*s*.) - -	1	27	40.29
By 8 observations on γ' Leonis, east (at 6*h*. 28*m*. 22*s*.) - -	1	27	40.71
1*st Result*—Chronometer No. 2557, fast (at 6*h*. 16*m*. 30*s*.) - - - - -	+ 1	27	40.50
By 6 obs. on α Tauri, west, and 9 obs. on β Tauri, also west, giving weight according to the number on each (at 9*h*. 09*m*.) - -	1	27	41.10
By 16 observations on α Bootis, east (at 10*h*. 25*m*.) - -	1	27	41.56
2*d Result*—Chronometer No. 2557, fast (at 9*h*. 47*m*.)	+ 1	27	41.33

	h.	m.	s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 8*h*. 02*m*.)	+ 1	27	40.92
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h*. 57*m*. mean time)	— 4	42.56	

10*th*. 1859, *March* 15*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	m.	s.	h.	m.	s.
By 8 observations on γ' Leonis, east (at 6*h*. 32*m*.)	1	28	34.13			
By 6 observations on η Tauri, west (at 7*h*. 00*m*.)	1	28	33.48			
1*st Result*—Chronometer No. 2557, fast (at 6*h*. 46*m*.)				+ 1	28	33.80

2*d Set.*

				h.	m.	s.
By 8 obs. on α Tauri, west, and 7 obs. on β Tauri, also west (at 8*h*. 48*m*.)	1	28	33.88			
By 12 observations on α Bootis, east (at 9*h*. 48*m*.)	1	28	34.51			
2*d Result*—Chronometer No. 2557, fast (at 9*h*. 18*m*.)				+ 1	28	34.20
Result adopted—Chronometer No. 2557, fast (at 8*h*. 02*m*.) giving the 2d result twice the weight of the 1st,				+ 1	28	34.07
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h*. 30*m*. mean time)				— 4	40.14	

When the stars composing the 1st Set, of this night, were observed, a very strong wind prevailed, which sometimes made it difficult to hold the sextant perfectly steady. When the stars composing the 2d Set were observed, there was but little wind, and the sextant could be held quite steady. For this reason we give the 2d result twice the weight of the 1st. This, however, makes the result adopted only .07 ($\frac{7}{100}$) of a second of time greater than would be obtained by a direct mean of the two results.

11*th.* 1859, *March* 19*th.* *At the same Station.*

Sidereal chronometer No. 2557, fast:	*h.*	*m.*	*s.*
By 7 observations on β Tauri, west (at 9*h.* 17*m.*)	1	29	01.60
By 13 observations on α Bootis, east (at 9*h.* 31*m.*)	1	29	01.66
Result—Chronometer No. 2557, fast of sidereal time for this station (at 9*h.* 24m. sidereal time)	+ 1	29	01.63
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 9*h.* 35*m.* mean time)	— 4	40	52

12*th.* 1859, *March* 31*st.* *At the same Station.*

Sidereal chronometer No. 2557, fast:	*h.*	*m.*	*s.*
By 8 observations on β Geminorum, west (at 11*h.* 35*m.*)	1	30	30.08
By 8 observations on α Coronæ Borealis, east (at 11*h.* 53*m.*)	1	30	30.50
Result—Chronometer No. 2557, fast of sidereal time for this station (at 11*h.* 44*m.*)	+ 1	30	30.29
By comparison—Chronometer No. 141 was slow of mean solar time for this station (at 11*h.* 08*m.*)	— 4	38	97

13*th.* 1859, *April* 3*d.* *At the same Station.*

Sidereal chronometer No. 2557, fast:	*h.*	*m.*	*s.*
By 8 observations on β Geminorum, west (at 11*h.* 11*m.*)	1	30	49.87
By 8 observations on α Coronæ Borealis, east (at 11*h.* 57*m.*)	1	30	49.94
Result—Chronometer No. 2557, fast of sidereal time for this station (at 11*h.* 34*m.*)	+ 1	30	49.90
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h.* 46*m.* mean time)	— 4	38	70.

14*th.* 1859, *April* 20*th.* *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 7 observations on β Tauri, west (at 9*h.* 37*m.*)	1	32	59.29			
By 8 observations on α Bootis, east (at 9*h.* 49*m.*)	1	32	59.64			
1*st Result*—Chronometer No. 2557, fast (at 9*h.* 43*m.*)				+ 1	32	59.46

2*d Set.*

By 8 observations on β Geminorum, west (at 11*h.* 20*m.*)	1	33	00.04			
By 9 observations on α Coronæ Borealis, east (at 11*h.* 52*m.*)	1	32	59.84			
2*d Result*—Chronometer No. 2557, fast (at 11*h.* 36*m.*)				+ 1	32	59.94
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 10*h.* 40*m.*)				+ 1	32	59.70
By comparison—Chronometer No. 141 was slow of mean solar time for this station (at 8*h.* 45m.)				— 4	41	06

15*th.* 1859, *April* 27*th.* *At the same Station.*

Sidereal chronometer No. 2557, fast:

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 10 observations on ϵ Bootis, east (at 10*h.* 53*m.*)	1	33	52.18			
By 10 observations on α Coronæ Borealis, also east (at 11*h.* 43*m.*)	1	33	52.05			
By 20 observations on 2 East stars (at 11*h.* 18*m.*)	1	33	52.11	+ 1	33	52.11
By 10 observations on β Geminorum, west (at 11*h.* 24*m.*)				+ 1	33	51.84
Result—Chronometer No. 2557, fast of sidereal time for this station (at 11*h.* 21*m.*)				+ 1	33	51.97

By comparison—Chronometer No. 141 was slow of mean solar time for this station (at 9*h*. 00*m*. mean time) . . - - — 4 41.14

16*th*. 1859, *April* 29*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

	h. *m*. *s*.	*h*. *m*. *s*.
By 9 observations on ε Bootis, east (at 11*h*. 00*m*.) - -	1 34 05.38	
By 15 observations on α Coronæ Borealis, also east (at 11*h*. 48*m*.)	1 34 05.41	
By 24 observations on 2 East stars (at 11*h*. 24*m*.) - -	1 34 05.40	
		+ 1 34 05.40
By 17 observations on β Geminorum, west (at 11*h*. 24*m*.) - . - -		+ 1 34 05.24
Result—Chronometer No. 2557, fast of sidereal time for this station (at 11*h*. 24*m*.) -		+ 1 34 05.32
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h*. 54*m*. mean time) - - - - -		— 4 41.48

17*th*. 1859, *May* 16*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

	h. *m*. *s*.
By 11 observations on β Geminorum, west (at 11*h*. 41*m*.) - - - - -	1 36 14.61
By 9 observations on α Coronæ Borealis, east (at 12*h*. 00*m*.) - - - . -	1 36 15.19
Result—Chronometer No. 2557, fast of sidereal time for this station (at 11*h*. 50*m*.) -	+ 1 36 14.90
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h*. 13*m*. mean time) - - - - -	— 4 41.43

18*th.* 1859, *May* 19*th.* *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	m.	s.	h.	m.	s.
By 12 observations on α Coronæ Borealis, east (at 12*h.* 26*m.*)	1	36	37.93			
By 12 observations on ε Leonis, west (at 12*h.* 44*m.*)	1	36	37.12			
1*st Result*—Chronometer No. 2557, fast (at 12*h.* 35*m.*)				+ 1	36	37.52

2*d Set.*

	h.	m.	s.	h.	m.	s.
By 9 observations on γ' Leonis, west (at 13*h.* 07*m.*)	1	36	37.31			
By 12 observations on ζ Herculis, east (at 13*h.* 30*m.*)	1	36	37.87			
2*d Result*—Chronometer No. 2557, fast (at 13*h.* 19*m.*)				+ 1	36	37.59

3*d Set.*

	h.	m.	s.	h.	m.	s.
By 5 observations on α Ophiuchi, east (at 13*h.* 42*m.*)	1	36	37.48			
By 6 observations on α Leonis, west (at 13*h.* 54*m.*)	1	36	37.60			
3*d Result*—Chronometer No. 2557, fast (at 13*h.* 48*m.*)				+ 1	36	37.52
Result adopted, or mean of the 3 *sets*—Chronometer No. 2557, fast of sidereal time for this station (at 13*h.* 14*m.*)				+ 1	36	37.55
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 9*h.* 25*m.* mean time)				— 4	40	16

19*th.* 1859, *May* 21*st.* *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	m.	s.	h.	m.	s.
By 9 observations on α Coronæ Borealis, east (at 12*h*. 18*m*.)	1	36	51.65			
By 10 observations on ε Leonis, west (at 12*h*. 40*m*.)	1	36	50.96			
1*st Result*—Chronometer No. 2557, fast (at 12*h*. 29*m*.)				+ 1	36	51.31

2*d Set.*

By 8 observations on β Geminorum, west (at 12*h*. 04*m*.)	1	36	50.75			
By 8 observations on ζ Herculis, east (at 12*h*. 34*m*.)	1	36	51.58			
2*d Result*—Chronometer No. 2557, fast (at 12*h*. 19*m*.)				+ 1	36	51.16
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 12*h*. 34*m*.)				+ 1	36	51.24
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h*. 27*m*. mean time)				— 4	41	08

20*th*. 1859, *May* 22*d*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

	h.	m.	s.	h.	m.	s.
By 10 observations on α Coronæ Borealis, east (at 12*h*. 14½*m*.)	1	36	58.55			
By 4 observations on ε Herculis, also east (at 12*h*. 57*m*.)	1	36	58.59			
By 14 observations on 2 East Stars, giving weight according to the number on each, (at 12*h*. 36*m*.)	1	36	58.56	+ 1	36	58.56
By 11 observations on ε Leonis, west (at 12*h*. 44*m*.)				+ 1	36	58.15
Result—Chronometer No. 2557, fast of sidereal time for this station (at 12*h*. 40*m*.)				+ 1	36	58.35

By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h.* 39*m.* mean time) - - - - - — 4 41 65

21*st.* 1859, *May* 24*th.* *At the same Station.*

Sidereal chronometer No. 2557, fast:

	h.	*m.*	*s.*
By 11 observations on α Coronæ Borealis, east (at 12*h.* 22*m.*) - - - - -	1	37	13.25
By 11 observations on ε Leonis, west (at 12*h.* 38*m.*)	1	37	12.75
Result—Chronometer No. 2557, fast of sidereal time for this station (at 12*h.* 30*m.*) - -	+ 1	37	13.00

By comparison—Chronometer No. 141, was slow of mean solar time (at 8*h.* 21*m.* mean time) - — 4 41.60

22*d.* 1859, *June* 3*d.* *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	*m.*	*s.*	
By 7 observations on δ Leonis, west (at 15*h.* 04*m.*) - - -	1	38	33.25	
By 8 observations on ϱ Cygni, east (at 15*h.* 24*m.*) - -	1	38	33.60	
1*st Result*—Chronometer No. 2557, fast (at 15*h.* 14*m.*) - -	1	38	33.42	
				+ 1 38 33.42

2*d Set.*

By 10 observations on α Lyræ, east (at 15*h.* 40*m.*) - -	1	38	33.00	
By 10 observations on α, or 12, Canum Venaticor. west (at 16*h.* 00*m.*) - - -	1	38	33.18	
2*d Result*—Chronometer No. 2557, fast (at 15*h.* 50*m.*) - -	1	38	33.09	
				+ 1 38 33.09

	h. m. s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 15*h*. 37*m*.)	+ 1 38 33.26
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h*. 48*m*. mean time)	— 4 44.22

23*d*. 1859, *June 6th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

1st Set.

	h. m. s.	h. m. s.
By 9 observations on γ' Leonis, west (at 14*h*. 19*m*.)	1 38 51.20	
By 12 observations on β Cygni, east (at 14*h*. 57*m*.)	1 38 51.26	
1*st Result*—Chronometer No. 2557, fast (at 14*h*. 38*m*.)	1 38 51.23	+ 1 38 51.23

2d Set.

	h. m. s.	h. m. s.
By 11 observations on δ Leonis, west (at 14*h*. 04*m*.)	1 38 51.20	
By 18 other observations at a later period of the night, on β Cygni, east (at 16*h*. 16*m*.)	1 38 51.52	
2*d Result*—Chronometer No. 2557, fast (at 15*h*. 10*m*.)	1 38 51.36	+ 1 38 51.36

3d Set.

	h. m. s.	h. m. s.
By 13 observations on α Lyræ, east (at 15*h*. 18*m*.)	1 38 51.82	
By 15 observations on α (or 12) Canum Venaticorum, west (at 16*h*. 12m.	1 38 51.50	
3*d Result*—Chronometer No. 2557, fast (at 15*h*. 45*m*.)	1 38 51.66	+ 1 38 51.66

	h.	m.	s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 15*h*. 11*m*.)	+ 1	38	51.42
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h*. 11*m*. mean time) - - - - - -	— 4	44	80

24*th*. 1859, *June* 10*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	m.	s.	h.	m.	s.
By 14 observations on γ' Leonis, west (at 14*h*. 28*m*.) - -	1	39	17.98			
By 13 observations on β Cygni, east (at 14*h*. 52*m*.) - -	1	39	17.98			
1*st Result*—Chronometer No. 2557, fast, (at 14*h*. 40*m*.) - -	1	39	17.98	+ 1	39	17.98

2*d. Set.*

By 12 observations on α Lyræ, east (at 15*h*. 37*m*.) - -	1	39	18.46			
By 14 observations on α (or 12) Canum Venaticorum, west (at 16*h*. 05*m*.)	1	39	18.28			
2*d Result*—Chronometer No. 2557, fast (at 15*h*. 51*m*.) - -	1	39	18.37	+ 1	39	18.37

3*d Set.*

By 24 observations on γ Cygni, east (at 16*h*. 55*m*.) - -	1	39	18.62			
By 15 observations on ϵ Bootis, west (at 17*h*. 21*m*.) - -	1	39	18.40			
3*d Result*—Chronometer No. 2557, fast (at 17*h*. 08*m*.) - -	1	39	18.51	+ 1	39	18.51

	h.	m.	s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 15*h*. 53*m*.)	+ 1	39	18.29
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h*. 37*m*. mean time)	— 4	46.59	

25*th*. 1859, *June* 22*d*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

1st Set.

	h.	m.	s.	h.	m.	s.
By 10 observations on δ Leonis, west (at 15*h*. 16*m*.)	1	40	48.05			
By 10 observations on β Cygni, east (at 15*h*. 29*m*.)	1	40	47.96			
1*st Result*—Chronometer No. 2557, fast (at 15*h*. 22*m*.)	1	40	48.00	+ 1	40	48.00

2d Set.

	h.	m.	s.	h.	m.	s.
By 9 observations on α (or 12) Canum Venaticorum, west (at 15*h*. 40*m*.)	1	40	47.63			
By 11 observations on α Lyræ, east (at 15*h*. 56*m*.)	1	40	48.05			
2*d Result*—Chronometer No. 2557, fast (at 15*h*. 48*m*.)	1	40	47.84	+ 1	40	47.84

3d Set.

	h.	m.	s.	h.	m.	s.
By 12 other observations on β Cygni, east (at 16*h*. 23*m*.)	1	40	48.06			
By 17 observations on ϵ Bootis, west (at 17*h*. 41*m*.)	1	40	48.31			
3*d Result*—Chronometer No. 2557, fast (at 17*h*. 02*m*.)	1	40	48.18	+ 1	40	48.18

	h.	m.	s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 16*h*. 04*m*.)	+ 1	40	48.00

By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h*. 02*m*. mean time) - - - - - - — 4 49.83

26*th*. 1859, *June* 24*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h. *m*. *s*.	*h*. *m*. *s*.
By 12 observations on α Lyræ, east (at 15*h*. 25*m*.) - - -	1 41 02.05	
By 12 observations on α Canum Venaticorum, west (at 16*h*. 02*m*.)	1 41 01.82	
1*st Result*—Chronometer No. 2557, fast (at 15*h*. 42*m*.) - -	1 41 01.94	+ 1 41 01.94

2*d Set.*

By 9 observations on δ Leonis, west (at 15*h*. 11*m*.) - -	1 41 01.74	
By 9 observations on ζ Cygni, east (at 16*h*. 46*m*.) - - -	1 41 02.16	
2*d Result*—Chronometer No. 2557, fast (at 15*h*. 58*m*.) - -	1 41 01.95	+ 1 41 01.95

3*d Set.*

By 9 observations on β Cygni, east (at 15*h*. 46*m*.) - - -	1 41 02.33	
By 11 observations on ε Bootis, west (at 18*h*. 18*m*.) - - -	1 41 02.52	
3*d Result*—Chronometer No. 2557, fast (at 17*h*. 02*m*.) - -	1 41 02.42	+ 1 41 02.42

Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 16*h*. 14*m*.) + 1 41 02.10

By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h*. 03*m*. mean time) - - - - - - — 4 50.21

27th. (*Omitted in the proper order of dates.*) 1858, *March 22d. At Chicago Observing Station, No.* 1, *in lat.* 41° 53′ 50″.3 *N.: long.* 5*h.* 50*m.* 30.99*s. west of the meridian of Greenwich.* See page 351 of Vol. VI. of the Society's Proceedings.

Mean solar chronometer No. 141, slow of mean time, at apparent noon:

	m.	*s.*
By 5 pairs of equal altitudes of the sun's upper and lower limbs - - - - -	— 4	56.26
By comparison.—Sidereal chronometer No. 2557, fast of sidereal time for this station, at apparent noon, (say at 0*h.* 06*m.* .4*s.* sidereal time) -	+ 49	55.67

I desired to get observations on East and West Stars for the *time* on the night of March 22d; but the sky was entirely clouded, which prevented it. On the next morning (March 23), I started with both chronometers, the sextant and artificial horizon, on a journey to Fulton and Albany, Illinois. I also visited Lyons, in Iowa. Having observed for the latitude and longitude of these places—depending for the longitude on the run of the two chronometers—I returned to Chicago on the evening of March 29th, 1858, and made the following observations for the *time*, viz:—

28th. 1858, *March 29th. At Chicago Observing Station No.* 1.

Sidereal chronometer No. 2557, fast:

	m.	*s.*	*m.*	*s.*
By 7 observations on α Tauri, west (at 8*h.* 48*m.*) - - - -	50	26.94		
By 11 observations on β Tauri, also west (at 9*h.* 21*m.*) - - -	50	27.14		
By 18 observations on 2 West Stars (at 9*h.* 08*m.*) giving weight according to the number of observations on each -	50	27.06		
			+ 50	27.06
By 20 observations on α Bootis, east (at 10*h.* 20*m.*) - - - -			+ 50	26.90
Result—Chronometer No. 2557, fast of sidereal time for this station (at 9*h.* 44*m.*) sidereal time			+ 50	26.98

	h.	m.	s.
By comparison—Chronometer No. 141 was slow of mean solar time for this station (at 9*h*. 15*m*. mean time) - - - - - - -	— 5	01	.76

P. S. The following determinations of the Chicago time (Nos. 29 and 30) were made after this paper was presented, with reference to a second determination of the longitude of the City of Rock Island, viz:—

29*th*. 1859, *July* 28*th*. *At Chicago Station No.* 3.

Sidereal chronometer No. 2557, fast:	h.	m.	s.
By 13 observations on ε Bootis, west (at 17*h*. 44*m*.)	+ 1	45	30.94
By 15 observations on ζ Cygni, east (at 18*h*. 06*m*.)	+ 1	45	31.40
Result—Chronometer No. 2557, fast of sidereal time for this station (at 17*h*. 55*m*.) -	+ 1	45	31.17
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 9*h*. 30*m*. mean time) - - - - - -	— 5	03	.37

30*th*. 1859, *July* 31*st*. *At the same Station.*

Sidereal chronometer No. 2557, fast:	h.	m.	s.
By 10 observations on ζ Cygni, east (at 17*h*. 45*m*.)	+ 1	45	53.86
By 10 observations on ε Bootis, west (at 18*h*. 01*m*.)	+ 1	45	54.13
Result—Chronometer No. 2557, fast of sidereal time for this station (at 17*h*. 53*m*.) -	+ 1	45	53.99
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 9*h*. 16*m*. mean time) - - - - -	— 5	05	.63

This ends the series of time-observations made at Chicago during the period included in this paper.

Rates of the Chronometers.

The rates of the chronometers during the period included in this paper, were as follows, viz:

1st. Rates of Sidereal Chronometer No. 2557.

FROM	TO	Elapsed Sidereal interval.	Rate per 24 Sidereal Hours.
		Days and Decimals.	+ Gaining.
1858.	1858.		*s.*
March 22,	March 29,	7.401	4 230
March 29,	June 19,	82.256	6 377
June 19,	June 20,*	1.002	7.075
July 21,	July 26,	5.117	6.369
July 26,	August 4,	8.999	6.260
August 4,	August 12,	8.018	5.580
August 12,	August 15,	3 002	5.620
August 15,	August 23,	7.991	6.110
August 23,	September 5,	12.990	5.930
September 5,	September 7,	2 079	6.000
September 7,	September 18, 1859.	10.931	5.538
September 18, 1859.	January 17,	121 354	7.048
January 17,	January 27,	10 146	5.220
January 27,	January 28,	0.835	5.230
January 28,	February 20,	23.071	7.140
February 20,	February 23,	3.211	5 120
February 23,	February 27,	3.815	6.550
February 27,	March 4,	5 155	5 800
March 4,	March 8,	3.925	6.480
March 8,	March 15,	7 000	7.590
March 15,	March 19,	4.057	6.793
March 19,	March 31,	12 097	7.330
March 31,	April 3,	2.993	6.550
April 3,	April 20,	16.963	7.650
April 20,	April 27,	7.028	7.430
April 27,	April 29,	2.002	6.669
April 29,	May 16,	17.018	7.610
May 16,	May 19,	3.057	7.366
May 19,	May 21,	1.965	6 966
May 21,	May 22,	1.011	7.033
May 22,	May 24,	1.993	7.351
May 24,	June 3,	10.130	7.923
June 3,	June 6,	2.982	6.086
June 6,	June 10,	4 029	6 669
June 10,	June 22,	12.007	7.470
June 22,	June 24,	2.007	7 025
June 24,	July 28,	34.070	7 897
July 28,	July 31,	2.999	7 610

*The rates from June 20, to July 21, 1858, are given at page 362 of Vol. VI. of the Society's Proceedings.

The above table shows clearly that the rate of sidereal chronometer, No. 2557, was accelerated when it was allowed to remain at rest, and that it was retarded (the rate of gaining diminished) by the effect of travelling, independent of the effect of change of temperature.

2d. Rates of Mean Solar Chronometer No. 141.

FROM	TO	Elapsed Mean Solar interval.	Rate per 24 Mean Solar Hours.
		Days and Decimals.	+Gaining. —Losing.
1858.	1858.		*s.*
March 22,	March 29,	7.385	— 0.744
March 29,	June 19,	82.031	+ 0.042
June 19,	June 20,*	1.000	— 0.760
July 21,	July 26,	5.103	+ 0.701
July 26,	August 4,	8.986	+ 0.690
August 4,	August 12,	7.994	+ 0.455
August 12,	August 15,	2.978	— 0.187
August 15,	August 23,	7.985	+ 0.145
August 23,	September 5,	12.954	— 0.068
September 5,	September 7,	2.064	+ 0.070
September 7,	September 18, 1859.	10.900	+ 0.020
September 18, 1859.	January 17,	121.023	+ 0.015
January 17,	January 27,	10.119	— 1.160
January 27,	January 28,	0.832	— 1.295
January 28,	February 20,	23.007	— 0.096
February 20,	February 23,	3.203	— 0.746
February 23,	February 27,	3.804	+ 0.052
February 27,	March 4,	5.140	— 0.008
March 4,	March 8,	3.915	+ 0.245
March 8,	March 15,	6.992	+ 0.346
March 15,	March 19,	4.045	— 0.094
March 19,	March 31,	12.065	+ 0.128
March 31,	April 3,	2.985	+ 0.090
April 3,	April 20,	16.916	— 0.140
April 20,	April 27,	7.011	— 0.011
April 27,	April 29,	1.996	— 0.170
April 29,	May 16,	16.971	+ 0.003
May 16,	May 19,	3.006	+ 0.377
May 19,	May 21,	1.959	— 0.470
May 21,	May 22,	1.008	— 0.565
May 22,	May 24,	1.988	+ 0.027
May 24,	June 3,	10.102	— 0.259
June 3,	June 6,	2.974	— 0.200
June 6,	June 10,	4.018	— 0.443
June 10,	June 22,	11.976	— 0.270
June 22,	June 24,	2.000	— 0.190
June 24,	July 28,	33.977	— 0.387
July 28,	July 31,	2.990	— 0.755

*See preceding foot note.

We will now give the observations that were made at the station whose positions were to be determined, following the order in which they are enumerated in the beginning of this paper.

VII. ASHTABULA, OHIO.

Station—The centre of the Public Square.

1*st. Observations for the Latitude* (*Approximate*) 1858, *Aug. 6th.*

The sky to the north was cloudy, and that to the south was still more so, which prevented observations, as satisfactory as could be wished, for the latitude. It was, however, obtained near enough for computing the observations on East and West Stars for the *time* and *longitude*, as follows, viz:—

By 14 circum-meridian altitudes on γ Cephei north, combined with 2 observations (circum-meridian) on Altair (α Aquilæ,) and 4 on γ Pegasi, both south;—latitude - - -	41° 52′ 04″ N.

2*d. Observations for the Time.*

Sidereal chronometer No. 2557, fast:

1*st Set. Before the Telegraph Signals.*

	m. *s.*	*m.* *s.*
By 5 observations on α Coronæ Borealis, west (at 20*h.* 02*m.*) -	36 34.55	
By 12 observations on α Andromedæ, east (at 20*h.* 28*m.*) - -	36 34.00	
1*st Result. Before the signals*—Chronometer No. 2557, fast (at 20*h.* 15*m.*)	36 34.27	+ 36 34.27

2*d Set. After the Signals.*

By 8 observations on α Cygni, west (at 24*h.* 29*m.*) - -	36 34.58	
By 11 observations on α Aurigæ (Capella) east (at 25*h.* 19*m.* or 1*h.* 19*m.* of Aug. 7th, sidereal)	36 35.11	
2*d Result. After the Signals*—Chronometer No. 2557, fast (at 0*h.* 54*m.* of Aug. 7th, sidereal) -	36 34.85	+ 36 34.85

Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 22*h*. 34*m*. of Aug. 6th, sidereal) - - - - + 0 34.56

3*d*. *For the Longitude.*

The above result, for the Ashtabula time, compared with the time-observations at Chicago, of the 4th and 12th of August, to obtain the rate of mean solar chronometer No. 141, and applied to the following telegraphic signals, gives the difference of longitude between those two places, and the longitude of Ashtabula west of the meridian of Greenwich, as follows, viz:—

The rate of the sidereal chronometer, from the period of its determination this night, back to the period of each signal, is deduced, in this instance, from the two sets of *time-observations* made this night. The great elapsed time here, being 4*h*. 39*m*., seemed to justify this.

Determination of the difference of Longitude between Chicago and Ashtabula, Ohio, by electric signals for comparisons of time, August 6th, 1858.

Sidereal Chronometer No. 2557, fast, of Ashtabula, sidereal time, (at 21*h*. 18*m*. sidereal time,) 36*m*. 34*s*.04.

Rate per sidereal day, + 3*s*.00; or per sidereal hour, + 0*s*.125.

Mean Solar Chronometer No. 141, slow, of Chicago, mean solar time, (at 11*h*. 49*m*. mean time,) 4*m*. 31*s*.02.

Rate per mean solar day, + 0*s*.455; or per mean solar hour, + 0*s*.01896.

1st.—Chicago signals recorded at both stations.

Times of Signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals as noted at Ashtabula by sidereal Chronometer No. 2557.	Ashtabula correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal. Ashtabula, east of the meridian of Chicago observing-station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
11 44 40	11 49 01.02	21 54 56.5	21 18 22.10	20 51 00.72	0 27 21.38
11 47 10	11 51 41.02	21 57 27	21 20 52.59	20 53 31.13	0 27 21.46
12 11 30	12 16 01.01	22 21 51	21 45 16.54	21 17 55.12	0 27 21.42
12 14 30	12 19 01.01	22 24 51.5	21 48 17.04	21 20 55.61	0 27 21.43

1st Mean.—Electric signals sent from Chicago to Ashtabula 0 27 21.422

2d.—Ashtabula signals recorded at both stations.

Times of signals given at Ashtabula by sidereal Chronometer No. 2557.	Times of Ashtabula signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Ashtabula signals.	Chicago reduced sidereal time of Ashtabula signals.	Ashtabula correct sidereal time of Ashtabula signals.	Difference of Longitude by each signal.—Ashtabula East of the meridian of Chicago observing station, No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m.* s.
22 09 49	11 59 30	12 04 01.02	21 05 53.16	21 33 14.57	0 27 21.41
22 12 49.5	12 02 30	12 07 01.02	21 08 53.65	21 36 15.06	0 27 21.41
22 15 50	12 05 30	12 10 01.01	21 11 54.13	21 39 15.56	0 27 21.43
22 18 50.5	12 08 30	12 13 01.01	21 14 54.62	21 42 16.05	0 27 21.43

2d Mean.—Electric signals sent from Ashtabula to Chicago, 0 27 21.42

1st Mean.—Electric signals sent from Chicago to Ashtabula, as above, - - - - - - 0 27 21.422

Result:—Centre of the Public Square at Ashtabula, east, in longitude of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - — 0 27 21.42

Longitude of Chicago observing station No. 3, west of the meridian of Greenwich, - + 5 50 31.20

Longitude of the centre of the Ashtabula Public Square, west of the meridian of Greenwich, - 5 23 09.78

Equal, in arc, to - - - - 80° 47′ 26″.7 W.

Latitude (approximate) as before, - - 41° 52′ 04″ N.

VIII. ERIE, PENNSYLVANIA.

Station.—The point of intersection of the two diagonal lines of the lumber-lot of Mr. William Sandborn, fronting on Sixth street, between Holland and French streets.

1*st. Observations for the Latitude.* 1858, *August 8th.*

	°	′	″
By 16 observations on Polaris, north, combined with 16 observations (circum-meridian) on α Aquarii, south, - - - - -	42	07	53.8
Same night—By 28 circum-meridian altitudes of Altair (α Aquilæ,) south, combined with 22 circum-meridian altitudes of γ Cephei, north, -	42	07	55.8
Result—Latitude of station, - - -	42	07	54.8 N.

2*d*. *Observations for the Time. August 8th*, 1858.

Sidereal chronometer No. 2557, fast:	
By 9 observations on α Coronæ Borealis, west (at 19*h*. 06*m*.)	*m*. *s*. 33 56.51
By 8 observations on α Andromedæ, east (at 20*h*. 24*m*.)	33 57.29
Result—Chronometer No. 2557, fast of sidereal time for this station (at 19*h*. 45*m*.)	+ 33 56.90

August 9th, 1858. Sidereal chronometer No. 2557, fast:

1*st Set.*

	m. *s*.	
By 13 observations on α Coronæ Borealis, west (at 19*h*. 25*m*.)	34 02.58	
By 12 observations on α Andromedæ, east (at 20*h*. 03*m*.)	34 02.45	
1*st Result*—Chronometer No. 2557, fast (at 19*h*. 44*m*.)	34 02.51	*m*. *s*. + 34 02.51

2*d Set.*

By 12 pairs of equal altitudes of α Cygni, observed east and west (at 20*h*. 8 6*m*. 38.44*s*. or meridian transit)	+ 34 02.73
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 20*h*. 10*m*.)	+ 34 02 62

3*d*. *The Longitude.*

In obtaining the difference of longitude between Erie and Chicago, we use the time by sidereal chronometer No. 2557, for the meridian of Erie as derived from the foregoing observations of August 9th. The rate of that chronometer, carried forward from the period of the determination of the said time to that of the signals, is derived from the observations made at Erie on the nights of August 8th and 9th.

The corresponding time for the meridian of Chicago, is derived from the observations made there on the 4th and 12th of August, which give the rate of the mean solar chronometer No. 141, during that interval, and also the means of reducing the Chicago time to the period of the said signals.

The signals and the results derived from them were as follows, viz.—

Determination of the difference of Longitude between Chicago and Erie, Pennsylvania, by electric signals for comparisons of time, August 9th, 1858.

Sidereal Chronometer No. 2557, fast, of Erie, sidereal time, (at 20*h*. 59*m*.. sidereal time,) 34*m*. 02*s*.81.

Rate per sidereal day, + 5*s*.62; or per sidereal hour, + 0*s*.234.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time, (at 11*h*. 15*m*. mean time,) 4*m*. 29*s*.67.

Rate per mean solar day, + 0*s*.455; or per mean solar hour, + 0*s*.01896.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago, by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Erie, by sidereal Chronometer No 2557.	Erie correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Erie east of the meridian of Chicago observing station No.3.
h. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.
11 11 00	11 15 29.67	21 33 16	20 59 13.19	20 29 03.50	0 30 09.69
11 13 50	11 18 19.67	21 36 06.5	21 02 03.68	20 31 53.97	0 30 09.71
11 16 50	11 21 19.67	21 39 07	21 05 04.17	20 34 54.46	0 30 09.71
11 19 50	11 24 19.67	21 42 07.5	21 08 04.66	20 37 54.85	0 30 09.71
11 22 30	11 26 59.67	21 44 48	21 10 45.15	20 40 35.40	0 30 09.75
11 43 39	11 48 08.66	22 06 00 5	21 31 57.56	21 01 47.86	0 30 09.70
11 46 39	11 51 08.66	22 09 01	21 34 58.05	21 04 48.35	0 30 09.70
11 49 42	11 54 11.66	22 12 04.5	21 38 01.54	21 07 51.85	0 30 09.69

1st Mean.—Electric signals sent from Chicago to Erie, - 0 30 09.708

2d.—Erie signals recorded at both stations.

Times of signals given at Erie by sidereal Chronometer No. 2557.	Times of Erie signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Erie signals.	Chicago reduced sidereal time of Erie signals.	Erie correct sidereal time of Erie signals.	Difference of Longitude by each signal.—Erie east of the meridian of Chicago observing station No.3.
h. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.
21 50 58	11 28 39	11 33 08.66	20 46 35.39	21 16 55.12	0 30 09.73
21 53 58.5	11 31 39	11 36 08.66	20 49 45.89	21 19 55.61	0 30 09.72
21 56 59	11 34 39	11 39 08.66	20 52 46.38	21 22 56.10	0 30 09.72
21 59 59.5	11 37 39	11 42 08.66	20 55 46.87	21 25 56.59	0 30 09.72
22 03 00	11 40 39	11 45 08.66	20 58 47.36	21 28 57.08	0 30 09.72

2d Mean.—Electric signals sent from Erie to Chicago, - - 30 09.722

1st Mean.—Electric signals sent from Chicago to Erie as above, 30 09.708

Result:—Erie Observing Station is east, in longitude, of Chicago Observing Station No. 3, by a mean of the two sets of signals, - - - - - - - — 30 09.715

	h.	m.	s.
Brought forward,	— 0	30	09.715
Longitude of Chicago observing station No. 3, west of the meridian of Greenwich,	+ 5	50	31.2
Longitude of Erie observing station west of the meridian of Greenwich,	+ 5	20	21.5
Equal, in arc, to	80°	05′	22″.5 W.
Latitude, as before,	42°	07′	54″.8 N.

My duties required me to return to Chicago immediately after completing the above observations. I arrived there on the morning of the 11th August. The night of that date was unfavourable for observations, which had to be deferred until the night of the 12th. This makes the elapsed time between the Chicago observations, which enter into the above determination of the longitudes of Ashtabula and Erie, from the 4th to the 12th of August; or 8 solar days, during which period we depend on the run of mean solar chronometer No. 141, in deducing those longitudes.

IX. TOLEDO, OHIO.

Station.—By a *true* azimuth derived from observations on Polaris (α Ursæ Minoris) with the theodolite, and a horizontal measurement with the chain, from this observing station to the point of intersection of the middle of Jefferson street, with the middle of Superior street, is S. 60° 14′ 57″ W., and the distance 141 feet.

1*st. Observations for the Latitude.* 1858, *August 13th.*

	°	′	″
By 5 circum-meridian altitudes of ζ Pegasi, and 7 circum-meridian altitudes of α Pegasi, both south, combined with 14 observed altitudes of Polaris (α Urs. Minoris) north,	41	39	02.85
1859, *January 24th.* By 18 circum-meridian altitudes of β Orionis, south, combined with 20 observed altitudes of Polaris, north,	41	39	01.97
By giving the 2d set twice the weight of the first, we get			
Result—Latitude of station,	41	39	02.26 N.

When the observations were made for the latitude on the night of August 13th, 1858, the sky to the south was so much clouded that no more observations could be made in that direction, for that object, than are above reported. The result then obtained agrees, however, well with that derived from the satisfactory set of observations made on the night of January 24th, 1859, on the occasion of a second visit to the same station. It is believed that the result reported is a pretty close determination.

2*d*. *Observations for the Time.* 1858, *August* 13*th*.

Sidereal chronometer No. 2557, fast:

1*st Set.*

	m.	*s.*		
By 7 observations on α Coronæ Borealis, west (at 19*h*. 29*m*.) -	48	15.59		
By 11 observations on α Andromedæ, east, (at 19*h*. 59*m*.) - -	48	15.31		
2*d Result*—Chronometer No. 2557, fast (at 19*h*. 44*m*.) - -	48	15.45	*m.*	*s.*
			+ 48	15.45

2*d Set.*

By 12 pairs of equal altitudes of α Cygni, observed east and west (at 20*h*. 36*m*. 38.43*s*.) - -	+ 48 14.85
Result adopted—Chronometer No. 2557, fast of sidereal time for this station, Aug. 13th, 1858, (at 20*h*. 10*m*.) - - - -	+ 48 15.15

3*d*. *The Longitude.*

The above determination of the Toledo time, and the Chicago time derived from the observations made there on the nights of August 4th and 12th, combined with the following telegraphic signals, give us the longitude of Toledo, Ohio, as follows, viz:—

Determination of the Difference of Longitude between Chicago and Toledo, Ohio, by electric signals for comparisons of time, August 13th, 1858.

Sidereal Chronometer No. 2557, fast, of Toledo, sidereal time, (at 20*h*. 49*m*. sidereal time,) 48*m*. 15*s*.30.

Rate per sidereal day, + 5*s*.62; or per sidereal hour, + 0*s*.234.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time, (at 11*h*. 03*m*. mean time,) 4*m*. 28*s*.5.

Rate per mean solar day, — 0*s*.187; or per mean solar hour, — 0*s*.0078.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Toledo, by sidereal Chronometer No. 2557.	Toledo correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Toledo east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 58 50	11 03 18.5	21 37 13.5	20 48 58.2	20 32 36.55	0 16 21.65
11 01 50	11 06 18.5	21 40 14	20 51 58.69	20 35 37.04	0 16 21.65
11 04 50	11 09 18 5	21 43 14.5	20 54 59.18	20 38 37.54	0 16 21.64
11 07 50	11 12 18.5	21 46 15	20 57 59.66	20 41 38.03	0 16 21.63

1st Mean.—Electric signals sent from Chicago to Toledo, Ohio, 0 16 21.642

2d.—Toledo signals recorded at both stations.

Times of signals given at Toledo, by sidereal Chronometer No. 2557.	Times of Toledo signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Toledo signals.	Chicago reduced sidereal time of Toledo signals.	Toledo correct sidereal time of Toledo signals.	Difference of Longitude by each signal.—Toledo east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
21 52 15	11 13 49	11 18 17.5	20 47 38.01	21 03 59.64	0 16 21.63
21 55 15	11 16 49	11 21 17.5	20 50 38.51	21 07 00.13	0 16 21.62
21 58 16	11 19 49	11 24 17.5	20 53 39.00	21 10 00.62	0 16 21.62
22 01 18.5	11 22 51	11 27 19.5	20 56 41.50	21 13 03.10	0 16 21.60

2d Mean.—Electric signals sent from Toledo, Ohio, to Chicago, 0 16 21.618

1st Mean.—Electric signals sent from Chicago to Toledo, Ohio, as above, - - - - - - - - - - 0 16 21.642

Result:—Toledo Observing Station is east, in longitude of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - - - - - — 0 16 21.63

	h.	m.	s.
Brought forward,	— 0	16	21.63
Longitude of Chicago observing station No. 3, west of the meridian of Greenwich, -	+ 5	50	31.20
Longitude of the Toledo observing station, west of the meridian of Greenwich, - -	+ 5	34	09.57
Equal, in arc, to - - -	83° 32′ 23″.55 W.		
Latitude, as before, - - -	41° 39′ 02″.26 N.		

From true azimuths from observations on Polaris, with the theodolite, and measured distances from the observing station, we are enabled to give the following table of the latitudes and longitudes of positions in the city of Toledo, viz.—

	North Latitude.	Longitude West of Greenwich.	
		In arc.	In Time.
1. Intersection of the middle of Jefferson Street, with the middle of Superior Street, - - - - -	41° 39′ 01″.57	83° 32′ 25″.16	h. m. s. 5 34 09.68
2. Steeple of the Methodist Church on the most western corner of Superior and Madison Streets,	41 39 05.92	83 32 22.42	5 34 09.49
3. Steeple of the Congregational Church on St. Clair Street, between Jefferson and Madison Streets, - - - - - - - - -	41 39 02.71	83 32 20.18	5 34 09.34
4. The Rail Road Depot, (ticket office,) - - - - - - - - -	41 38 47.04	83 32 17.75	5 34 09.19

On the map accompanying the report of Captain Andrew Talcott, of his operations and observations in determining the boundary line between the States of Michigan and Ohio, in the year 1833 (see Doc. No. 497 of the House of Representatives, of the 23d Congress, 1st Session), he places Toledo in latitude 41° 38′ 43″, and in longitude 83° 22′ 28″=5*h*. 33*m*. 29.87*s*. west of Greenwich, as near as we can measure by the map scale. Our latitudes agree well, considering the difference of stations occupied; but in longitude, my determination places Toledo 9′ 50″ in arc = 39.33*s*. of time west of the position given to it on Captain Talcott's map, as printed on a scale of 5 miles to 1 inch, to accompany his report. This difference in longitude is equal to 8.48 statute miles.

X. PRAIRIE DU CHIEN, WISCONSIN.

Station.—This station is 122 feet due north from the front door of the Telegraph Office at the depot of the Milwaukee and Mississippi Rail Road, on the left bank of the Mississippi river.

1*st. Observations for the Latitude.* 1858, *July* 13*th.*

	°	′	″	
By 10 observed altitudes of α Ursæ Minoris (Polaris,) north, combined with 24 circum-meridian altitudes of β Aquarii, south; Latitude of station	43	02	01.35	N.

The sky was so much clouded to the north, all night, that I could obtain no more than ten observations on Polaris, and β Aquarii was the only star that could be observed on, south, for the latitude. It was only by watching the sky until an hour and a half past midnight, that the above result could be obtained. Still later watching was necessary, as will presently appear, to obtain the desired observations for the *time* at this place.

2*d. Observations for the Time. Same night.*

Sidereal chronometer No. 2557, fast:

1st Set.

	h.	*m.*	*s.*				
By 16 observations on α Coronæ Borealis, west (at 18*h*. 07*m*.)	1	15	39.18				
By 9 observations on α Andromedæ, east (at 20*h*. 43*m*.)	1	15	39.94				
1*st Result*—Chronometer No. 2557, fast (at 19*h*. 25*m*.)	1	15	39.56	*h.*	*m.*	*s.*	
				+ 1	15	39.56	

2d Set.

By 7 observations on α Bootis (Arcturus) west (at 17*h*. 39*m*.)	1	15	39.60
By 12 observations on α Lyræ, also west (at 22*h*. 05*m*.)	1	15	40.49
Mean from 2 West Stars (at 19*h*. 52*m*.)	1	15	40.04
By 12 observations on α Cygni, east (at 17*h*. 10*m*.)	1	15	39.43

	h. m. s.	h. m. s.
2d Result—Chronometer No. 2557, fast (at 18*h*. 31*m*.) - -	1 15 39.74	+ 1 15 39.74
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 18*h*. 58*m*.)		+ 1 15 39.65

3*d*. *The Longitude.*

The above determination of the Prairie du Chien time, and the Chicago time as observed on the nights of the 12th and 15th of July, already given at pp. 358 and 359 of Vol. VI. (No. 60) of the Society's Proceedings, and the rates of the two chronometers between those two dates, given at page 362 of the same volume, combined with the following telegraphic signals, give us the longitude of our Prairie du Chien station, as follows, viz.—

Determination of the difference of Longitude between Chicago and Prairie du Chien, Wisconsin, by electric signals for comparisons of time, July 13, 1858.

Sidereal Chronometer No. 2557, fast, of Prairie du Chien sidereal time, (at 18*h*. 47*m*. sidereal time,) 1*h*. 15*m*. 39*s*.61.

Rate per sidereal day, + 4*s*.91; or per sidereal hour, + 0*s*.2045.

Mean solar Chronometer No. 141, slow, of Chicago mean solar time, (at 11*h*. 34*m*. mean time,) 4*m*. 44*s*.51.

Rate per mean solar day, — 0*s*.03; or per mean solar hour, — 0*s*.0013.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Prairie du Chien by sidereal Chronometer No. 2557.	Prairie du Chien correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Prairie du Chien west of the meridian of Chicago observing station No. 2.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
11 29 20	11 34 04.51	20 02 50.5	18 47 10.89	19 01 14.35	0 14 03.46
11 32 10	11 36 54.51	20 05 41	18 50 01.38	19 01 04.81	0 14 03.43
11 35 20	11 40 04.51	20 08 51.5	18 53 11.87	19 07 15.33	0 14 03.46
11 58 50	12 03 34.51	20 32 25.5	19 16 45.79	19 30 49.19	0 14 03.40
12 02 00	12 06 44.51	20 35 36	19 19 56.28	19 33 59.71	0 14 03.43

1st Mean.—Electric signals sent from Chicago to Prairie du Chien, 0 14 03.436

2d.—Prairie du Chien signals recorded at both stations.

Times of signals given at Prairie du Chien by sidereal Chronometer No. 2557.	Times of Prairie du Chien signals, as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Prairie du Chien signals.	Chicago reduced sidereal time of Prairie du Chien signals.	Prairie du Chien correct sidereal time of Prairie du Chien signals.	Difference of Longitude by each signal.—Prairie du Chien west of the meridian of Chicago observing station No. 2.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
20 41 30	12 07 53	12 12 37.51	19 39 53.68	19 25 50.26	0 14 03.42
20 44 30.5	12 10 53	12 15 37.51	19 42 54.17	19 28 50.75	0 14 03.42
20 47 31	12 13 53	12 18 37.51	19 45 54.66	19 31 51.24	0 14 03.42
20 50 30.5	12 16 52.	12 21 36.51	19 48 54.16	19 34 50.73	0 14 03.43

2d Mean.—Electric signals sent from Prairie du Chien to Chicago, 0 14 03.422

1st Mean.—Electric signals sent from Chicago to Prairie du Chien, as above, - - - - - - - - - - - 0 14 03.436

Result:—Prairie du Chien observing station is west, in longitude, of Chicago observing station No. 2, by a mean of the two sets of signals, - - - - - - - - - + 0 14 03.429

	h.	*m.*	*s.*
Longitude of Chicago observing station No. 2, west of the meridian of Greenwich, - -	+ 5	50	31.15
Longitude of Praire du Chien observing station, west of the meridian of Greenwich, - -	6	04	34.58

Equal, in arc, to - - - - 91° 08′ 38″.7 W.

Latitude of this station, as above, - 43° 02′ 01″.35 N.

The above determination will be found, we think, to correspond very nearly with that of Mr. J. N. Nicollet, derived by him from observations made in the year 1839, while employed in exploring the hydrographical basin of the Mississippi. His station was the American Fur Company's house, near Fort Crawford. An interesting discussion of the several observations which led him to the longitude which he adopted for that station, will be found in his report at page 117, of Senate Document No. 273, of the 26th Congress, 2d Session, printed in the year 1843.

He there states the longitude of that point to be,

	h.	*m.*	*s.*
West of the meridian of Greenwich, - -	6	04	35.55

Equal, in arc, to - - - 91° 08′ 53″.25*

In his table of geographical positions, however, at page 123, he states that position to be in

Latitude - - - - 43° 03′ 06″ N.

Longitude, west from Greenwich, - 6*h*. 04*m*. 37.3*s*.

* Erroneously printed in that document, 93°, &c.

I only spent the night in observing at Prairie du Chien, and was obliged to leave that place early the next morning, on my return to Chicago. Hence I had no opportunity for making any survey to connect our two stations, and thus determine accurately their relative positions. In looking up the Mississippi, however, from my station, I observed that its course upward appeared, when compared with the direction of the North Star (Polaris) to be a very little west of north. The difference of our longitudes, reduced to a common point, is not probably more than one second of time; and, judging by the eye, of the distance from my station to the Fur Company's old house, our latitudes appear to agree very closely.

XI. DUNLEITH, ILLINOIS.

Station.—One hundred feet east from the left shore of the Mississippi river, between the freight depot and the passenger house of the Northwestern terminus of the Illinois Central Rail Road. From the observing station to a point perpendicularly under the most northern of the two cupolas on the north end of the ticket office, of this rail road depot, is S. 13° W. 250 feet, horizontal measurement.

1*st.* *The Latitude.* 1859, *February* 22*d.*

	°	′	″
By 37 circum-meridian altitudes of β Orionis, south, combined with 24 altitudes of Polaris (α Ursæ Minoris,) north, - - - -	42	29	45.16
Same night.—By 26 circum-meridian altitudes of α Hydræ, south, combined with 14 other altitudes of Polaris, observed 5 hours later than the previous set, - - - - -	42	29	44.65
Result—Latitude of station, - -	42	29	44.9 N.

2*d.* *Observations for the Time.* 1859, *February* 21*st.*

Sidereal chronometer No. 2557, fast :

1*st Set.* *Before the telegraphic signals.*

	h.	*m.*	*s.*
By 10 observations on α Arietis, west (at 6*h.* 16*m.*) - -	1	38	14.48
By 11 observations on γ' Leonis, east (at 6*h.* 39*m.*) - -	1	38	14.67

1*st Result. Before the signals*— Chronometer No. 2557, fast (at 6*h*. 27*m*.)	*h*.	*m*.	*s*.	*h*.	*m*. *s*.
	1	38	14.57	+ 1	38 14.57

2d Set. After the telegraphic signals.

By 13 observations on α Bootis (Arcturus) east (at 10*h*. 37*m*.)	1	38	15.60
By 14 observations on β Geminorum, west (at 11*h*. 11*m*.)	1	38	14.88
2d Result. After the signals— Chronometer No. 2557, fast (at 10*h*. 54*m*.)	1	38	15.24
			+ 1 38 15.24
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 8*h*. 40*m*.) Feb. 21st, 1859			+ 1 38 14.90

1859, *Feb. 22d. At the same Station.*

Sidereal chronometer No. 2557, fast:

1st Set. Before the telegraphic signals.

	h.	*m*.	*s*.
By 10 observations on α Arietis, west (at 6*h*. 03*m*.)	1	38	19.55
By 10 observations on γ' Leonis, east (at 6*h*. 31*m*.)	1	38	20.09
1st Result. Before the signals— Chronometer No. 2557, fast (at 6*h*. 17*m*.)	1	38	19.82
			+ 1 38 19.82

2d Set. After the telegraphic signals.

By 14 observations on β Geminorum, west (at 11*h*. 02*m*.)	1	38	20.52
By 11 observations on α Bootis, east (at 11*h*. 26*m*.)	1	38	20.79
2d Result. After the telegraphic signals——Chronometer No. 2557, fast (at 11*h*. 14*m*.)	1	38	20.65
			+ 1 38 20.65

Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 8*h*. 46*m*.) Feb. 22d, 1859, - - - - *h*. *m*. *s*. + 1 38 20.23

3*d*. *The Longitude.*

We have two determinations of the longitude of our Dunleith station. The first is derived from the time-observations made at that station, and the signals interchanged with Chicago, on the night of Feb. 21st. The second is derived from the similar observations and signals made on the night of Feb. 22d. They both depend in part upon the run of the mean solar chronometer No. 141, while at rest at Chicago as ascertained by the time-observations made there on the nights of Feb. 20th and 23d, already given.

The telegraphic signals, and the results, for the 1st determination, are as follows, viz.—

Determination of the difference of Longitude between Chicago and Dunleith, Illinois, by electric signals for comparisons of time, February 21st, 1859.

Sidereal Chronometer No. 2557, fast, of Dunleith, sidereal time, (at 9*h*. 41*m*. sidereal time,) 1*h*. 38*m*. 14.90*s*.

Rate per sidereal day, + 5*s*.308; or per sidereal hour, + 0*s*.221.

Mean Solar Chronometer No. 141, slow, of Chicago, mean solar time, (at 10*h*. 47*m*. mean time,) 4*m*. 42*s*.14.

Rate per mean solar day, — 0*s*.746; or per mean solar hour, — 0*s*.03109.

1st.—Chicago signals recorded at both stations.

Times of Signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals as noted at Dunleith by sidereal Chronometer No. 2557.	Dunleith correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal. Dunleith west of the meridian of Chicago observing station No. 3.
h. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.
10 42 10	10 46 52.14	10 19 16.5	8 41 01.60	8 53 06.27	0 12 04.67
10 45 10	10 49 52.14	10 22 17	8 44 02.09	8 56 06.76	0 12 04.67
10 48 10	10 52 52.14	10 25 17.5	8 47 02.58	8 59 07.26	0 12 04.68

1st Mean.—Electric signals sent from Chicago to Dunleith, 0 12 04.673

2d.—Dunleith signals recorded at both stations.

Times of signals given at Dunleith by sidereal Chronometer No. 2557.	Times of Dunleith signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Dunleith signals.	Chicago reduced sidereal time of Dunleith signals.	Dunleith correct sidereal time of Dunleith signals.	Difference of Longitude by each signal.—Dunleith west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 28 18	10 51 10	10 55 52.14	9 02 07.75	8 50 03.06	0 12 04.69
10 31 18.5	10 54 10	10 58 52.14	9 02 08.24	8 53 03.55	0 12 04.69
10 34 19.0	10 57 10	11 01 52.15	9 08 08.74	8 56 04.04	0 12 04.70
10 43 20.5	11 06 10	11 10 52.15	9 17 10.22	9 05 05.51	0 12 04.71
10 46 21	11 09 10	11 13 52.15	9 20 10.71	9 08 06.00	0 12 04.71

2d Mean.—Electric signals sent from Dunleith to Chicago, 0 12 04.70

1st Mean.—Electric signals sent from Chicago to Dunleith, as above, - - - - - - - - - - 0 12 04.673

Result:—Dunleith Station No. 1, is west, in longitude of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - - - - - — 0 12 04.686

Longitude of Chicago observing station No. 3, west of the meridian of Greenwich, - + 5 50 31.20

Determination 1st.

Longitude of Dunleith observing station, west of the meridian of Greenwich, - - - 6 02 35.88

For the second determination, reference must be had to the time-observations at Dunleith, of the 22d of February; and to those at Chicago, as before stated, of the 20th and 23d of February, and to the following telegraphic signals, viz.—

Determination of the difference of Longitude between Chicago and Dunleith, Illinois, by electric signals for comparisons of time, February 22, 1859.

Sidereal Chronometer No. 2557, fast, of Dunleith sidereal time, (at 10*h*. 00*m*. sidereal time), 1*h*. 38*m*. 20*s*.51.

Rate per sidereal day, + 5*s*.308; or per sidereal hour, + 0*s*.221.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time, (at 12*h*. 01*m*. 42*s*. mean time), 4*m*. 42*s*.92.

Rate per mean solar day, — 0*s*.746; or per mean solar hour, — 0*s*.03109.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Dunleith by sidereal Chronometer No. 2557.	Dunleith correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Dunleith west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
11 57 00	12 01 42.92	11 38 22	10 00 01.50	10 12 05.91	0 12 04.41
12 00 00	12 04 42.92	11 41 22.5	10 03 01.99	10 15 06.40	0 12 04.41
1st Mean.—Electric signals sent from Chicago to Dunleith,					0 12 04.41

2d.—Dunleith signals recorded at both stations.

Times of signals given at Dunleith by sidereal Chronometer No. 2557.	Times of Dunleith signals, as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Dunleith signals.	Chicago reduced sidereal time of Dunleith signals.	Dunleith correct sidereal time of Dunleith signals.	Difference of Longitude by each signal.—Dunleith west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
11 47 23.5	12 06 00	12 10 42.93	10 21 07 39	10 09 0 .97	0 12 04.42
11 50 24	12 09 00	12 13 42.93	10 24 07.88	10 12 03.45	0 12 04.43
11 53 24.5	12 12 00	12 16 42.93	10 27 08.37	10 15 03.94	0 12 04.43
11 56 25	12 15 00	12 19 42.93	10 30 08.87	10 18 04.43	0 12 04.44
2d Mean.—Electric signals sent from Dunleith to Chicago, -					0 12 04.43
1st Mean.—Electric signals sent from Chicago to Dunleith, as above, - - - - - - - -					0 12 04.41
Result: Dunleith station No. 2, is west in longitude of Chicago station No. 3, by a mean of the two sets of signals,					+ 0 12 04.42
Longitude of Chicago Station No. 3, -					+ 5 50 31.20

Determination 2d.

Longitude of Dunleith observing station, west of the meridian of Greenwich, by this 2d determination of Feb. 22d, 1859, - - - -	6 02 35.62

Determination 1st.

By the observations and signals of February 21st, as above given, - - - -	6 02 35.88
Result adopted—Longitude of the Dunleith observing station, west of the meridian of Greenwich, by a mean of the two determinations, - -	6 02 35.75
Equal, in arc, to - - -	90° 38′ 56″.25
Latitude of this station, as before given, -	42° 29′ 44″.9 N.

Result—By the measured offset and azimuth, from this station, given at the beginning of this article XI. the most northern cupola on the top of the ticket-office of the rail road depot, is in—

Latitude - - - -	42° 29′ 42″.5 N.
Longitude, west of Greenwich, - -	6*h*. 02*m*. 35.8*s*.
Equal, in arc, to - - -	90° 38′ 57″ W.

Dunleith is at the north-western terminus of the Illinois Central Rail Road, on the east bank of the Mississippi river, and occupies the site of the old Indian village of *Sinipi*. Extensive earth works, consisting of mounds thrown up in oval forms by the tribe which formerly resided here, still exist at Dunleith, in a state of perfect preservation. We had no time to devote to them that minute exploration which would no doubt show their contents to be similar to those of the numerous Indian mounds examined by Professor J. A. Lapham, of Milwaukee, and described in his valuable memoir, published in the year 1855, by the Smithsonian Institution, under the title of "THE ANTIQUITIES OF WISCONSIN."

The position of *Sinipi* (now Dunleith), is laid down on the map of Nicollet, in latitude 42° 36′ north, and in longitude, west of the meridian of Greenwich, 6*h*. 02*m*. 38.6*s*. = 90° 39′ 39″. Nicollet did not, however, make any astronomical observations at this or any other point on the Mississippi, between the "Head of the Upper Rapids, below Port Biron and Parkhurst," and "Prairie du Chien. We infer from his report, that the extensive reach of the Mississippi, from latitude 41° 36′ 08″ to latitude 43° 03′ 06″, was laid down on his map, from the surveys made under the direction of the General Land Office of the United States, checked by his observations made at the two extreme points above mentioned. (See his table of Geographical positions, page 123 of Senate Doc. No. 237, of the 26th Congress, 2d Session.) Nicollet's longitude, thus derived, agrees very closely with ours; but in latitude he is 6′ 18″ = 7¼ miles north of us. Dubuque is placed equally out of position, in latitude, on his map; but it appears to be very correct in longitude.

In the last map issued from the War Department of the "Territory of the United States, from the Mississippi to the Pacific Ocean," these cities are laid down correctly in longitude, but they are placed four minutes, = 4⅚ miles too far north in latitude.

The boundary line between the State of Illinois on the north, and the State of Wisconsin on the south, is defined to be along the parallel of 42° 30′ of latitude.

We regret that we had not time to make a connection, by survey, from our astronomical station at Dunleith, to the stone monument on the east bank of the Mississippi river, erected to mark the western terminus of this boundary line. From a close reconnoissance, however, we infer that the latitude of this monument is about 42° 30′ 20″, and hence, that the monument is placed about one-third of a mile too far to the north.

XII. DUBUQUE, IOWA.

This city is situated on the west bank of the Mississippi river, opposite to Dunleith, Illinois.

From a reconnoissance and bearings observed from several points in Dunleith, based on the latitude and longitude of our Dunleith station, as already given, we are enabled to give the approximate position of Dubuque as follows. The distance between the two points being, in a direct line, not more than one and one-fourth mile, viz.—

CENTRE OF THE CITY OF DUBUQUE.

Latitude, - - - -	42° 29′ 55″ N.
Longitude, west of the meridian of Greenwich,	6*h*. 02*m*. 40*s*.
Equal, in arc, to - - -	90° 40′ 00″

XIII. FULTON, ILLINOIS.

This city is situated on the east shore of the Mississippi river, 136 miles west of Chicago, by the track of the Chicago, Dixon, and Iowa Air Line Rail Road, of which it is, at present, the western terminus. Immediately opposite is the city of Lyons, situated on the west shore of the Mississippi. Observations were made at both places, and the observing stations were connected by a triangulation and azimuths, derived from an observation on Polaris (α Ursæ Minoris). From the astronomical station at Fulton, to that at Lyons, is 3595.5 feet, on an azimuthal course of N. 68° 43′ W. Hence the Lyons station is + 12″.89 north of the parallel and + 44″.29 in arc, = + 2*s*.95 in time, west of the meridian of the Fulton Station. We shall have occasion to use this difference of latitude in applying a common correction (— 1″.92 in the one case, and + 1″.92 in the other), to the observed latitudes of these two stations, in order to render the difference of their latitudes consistent with the result of the survey. The survey gave us, also, the longitude of the Lyon's Station, based on that of the

Fulton Station, derived from comparison by means of the two chronometers, with the longitude of Chicago.

We now proceed to give the observations at Fulton :—

Position of the Fulton Station.—From this station to the intersection of the middle of Base Street, with the middle of Cherry Street, is N. 53° 24′ 53″ W. (true) and the distance is 302 feet. Hence the reduction in latitude is + 1″.71, and in longitude + 3″.20 in arc, or + 0*s*.214 in time.

1*st. Observations for the Latitude.* 1858, *March* 24*th.*

	°	′	″
By 19 circum-meridian altitudes of Polaris (lower transit) north, combined with 26 circum-meridian altitudes of α Virginis, south, - - -	41	52	03.25
Correction due to survey, connecting with the Lyons observing station, - - - -			— 1.92
Latitude of station adopted, - -	41	52	01.33 N.

2*d. Observations for the Time.* 1*st.* 1858, *March* 24*th.*

Mean solar chronometer was fast of mean solar time at apparent noon:
By 2 pairs of equal altitudes of the sun's lower limb, + 5*m*. 10.72*s*.

	h.	*m*.	*s*.
By comparison—Chronometer No. 2557, was fast of sidereal time for this station at apparent noon (say at 0*h*. 14*m*. sidereal time) - -	+ 1	00	13.75

2*d.* 1858, *March* 28*th.*

Sidereal chronometer No. 2557, fast :			
By 10 observations on α Tauri, west, and 9 observations on β Tauri, also west (at 8*h*. 40*m*.)	+ 1	00	31.93
By 24 observations on ε Bootis, east (at 10*h*. 30*m*.)	+ 1	00	31.87
Result—Chronometer No. 2557, fast of sidereal time for this station (at 9*h*. 35*m*. sidereal time)	+ 1	00	31.90
By comparison—Chronometer No. 141, was fast of mean solar time for this station (at 9*h*. 10*m*. mean time) - - - -		+ 5	07.94

3d. The Longitude.

1. By the transmission of mean solar chronometer No. 141, from Chicago to Fulton and back to Chicago, between the 22d and 29th of March, 1858. *Rate*, during the elapsed time, — 0*s*.744 per mean solar day.

1858, *March 24th*.—Chronometer No. 141, was fast of Fulton mean solar time at apparent noon,		*m*. *s*. + 5 10.72
1858, *March 22d*.—Slow of Chicago mean solar time at Chicago, apparent noon, - - -	*m*. *s*. — 4 56.26	
Elapsed time, 2.007 mean solar days, allowing for diff. of longitude of stations, × — 0*s*.744, =	— 1.49	
Chronometer No. 141, slow of Chicago mean time, at the period of Fulton apparent noon, of March 24th, 1858, - - -	— 4 57.75	
		— 4 57.75
(*a*) Difference—Fulton, west of Chicago, -		+ 10 08.47

2. By sidereal chronometer No. 2557:

1858, *March 24th*.—Chronometer fast of Fulton sidereal time (at 0*h*. 14*m*. sidereal time)		+ 1 00 13.75
1851, *March 22d*.—Fast of Chicago sidereal time (at 0*h*. 06*m*. 44*s*. sidereal time) - -	*h*. *m*. *s*. + 0 49 55.67	
Elapsed time, allowing for diff. in long. = 2.012 sider. days, × + 4*s*.23, the rate per sidereal day,	= + 8.51	
Chronometer No. 2557, fast of Chicago sidereal time, at the period of the Fulton time observations,	+ 50 04.18	
		+ 50 04.18
(*b*) Difference.—Fulton west of Chicago, - -		+ 10 09.57

If we take the time-observations at Fulton, of the 28th March, 1858,

as the basis of the comparisons, a similar process to the above, will give us the following additional results, viz.—

	m.	s.
(*c*) By mean solar chronometer No. 141: Fulton west of Chicago,	+ 10	08.96
(*d*) By sidereal chronometer No. 2557: Fulton west of Chicago,	+ 10	09.15
Mean of the 4 results, *a*, *b*, *c*, *d*,	+ 10	09 04
Longitude of Chicago observing station No. 1,	+ 5	50 30.99

1st Determination.

	h.	m.	s.
Longitude of Fulton observing station, by the run of the two chronometers, west of the meridian of Greenwich,	6	00	40.03

On this journey, the chronometers were transported in the rail cars. Each chronometer was carried in a small basket, resting within a nest of elastic curled hair, with a lining of soft green baize between the hair and the chronometer. Every pains was taken to protect them from jolts and all kinds of rough usage. From long experience, I believe that good results for differences of longitude, derived from transporting chronometers, depend much more upon this sort of care and attention to them, than upon any other circumstances attending the operation. A few seconds of time are easily lost by careless handling of the chronometers.

In the present month of June, 1859, I determined to test the above result for the longitude, by the method more recently followed, of transmitting time-signals by the electric telegraph.

For this purpose, the time-observations of Chicago, given under the dates of June the 22d and 24th, and those now to be given under the date of June 23d, together with the signals, were made.

1859, *June 23d. At the Fulton Observing Station, already described.*

Sidereal chronometer No. 2557, fast:

1st Set. Before the Signals.

	h.	m.	s.
By 8 observations on α Lyræ, east (at 15*h*. 20*m*.)	1	51	04.00
By 12 observations on α (12) Canum Venaticorum, west (at 16*h*. 00*m*.)	1	51	04.21

	h. m. s.	h. m. s.
1st *Result*—Chronometer No. 2557, fast (at 15*h*. 40*m*.) - -	1 51 04.10	+ 1 51 04.10

2d Set. After the Signals.

By 14 observations on ε Bootis, west (at 18*h*. 03*m*.) - - -	1 51 04.47	
By 10 observations on ζ Cygni, east (at 18*h*. 23*m*.) - - -	1 51 04.49	
2*d Result*—Chronometer No. 2557, fast (at 18*h*. 13*m*.) - -	1 51 04.48	+ 1 51 04.48
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 16*h*. 56*m*.)		+ 1 51 04.29

The above result, and the results of the time-observations at Chicago of the 22d and 24th of June, applied to the telegraphic signals, give us a second determination of the longitude of our Fulton Station, as follows, viz.—

Determination of the Difference of Longitude between Chicago and Fulton, Illinois, by electric signals for comparisons of time, June 23d, 1859.

Sidereal Chronometer No. 2557, fast, of Fulton, sidereal time, (at 16*h*. 29*m*. 23*s*. sidereal time), 1*h*. 51*m*. 04*s*.16.

Rate per sidereal day, + 7*s*.025; or per sidereal hour, + 0*s*.2927.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 10*h*. 32*m*. 20*s*. mean time) 4*m*. 50*s*.03.

Rate per mean solar day, — 0*s*.19; or per mean solar hour, — 0*s*.0079.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Fulton by sidereal Chronometer No. 2557.	Fulton correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Fulton west of the meridian of Chicago observing station No. 3.
h. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.
10 27 30	10 32 20.03	18 20 27	16 29 22.84	16 39 31.57	0 10 08.73
10 30 30	10 35 20.03	18 23 27.5	16 32 23.33	16 42 32.06	0 10 08.73
10 33 30	10 38 20.03	18 26 28	16 35 23.82	16 45 32.55	0 10 08.73
10 45 30	10 50 20.03	18 38 30	16 47 25.75	16 57 34.52	0 10 08.77
1st Mean.—Electric signals sent from Chicago to Fulton, -					0 10 08.74

2d.—Fulton signals recorded at both stations.

Times of signals given at Fulton, by sidereal Chronometer No. 2557.	Times of Fulton signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Fulton signals.	Chicago reduced sidereal time of Fulton signals.	Fulton correct sidereal time of Fulton signals.	Difference of Longitude by each signal.—Fulton west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
18 29 28.5	10 36 30	10 41 20.03	16 48 33.05	16 38 24.29	0 10 08.76
18 32 29.0	10 39 30	10 44 20.03	16 51 33.54	16 41 24.78	0 10 08.76
18 35 29.5	10 42 30	10 47 20.03	16 54 34.03	16 44 25.27	0 10 08.76

2d Mean.—Electric signals sent from Fulton to Chicago, - 0 10 08.76

1st Mean.—Electric signals sent from Chicago to Fulton, as above, - - - - - - - - 0 10 08.74

Result:—Fulton Observing Station is west, in longitude of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - - - - - + 0 10 08.75

Longitude of Chicago observing station No. 3, + 5 50 31.20

2d Determination, June 23d, 1859.

Longitude of Fulton Station, west of the meridian of Greenwich, by the time-observations and the electric signals exchanged June 23d, 1859, - 6 00 39.95

1st Determination, March 1858.

Longitude of the same station by the time-observations, and the transportation of the two chronometers between the 22d and 29th of March, 1858, above given, - - - - 6 00 40.03

Result adopted—Longitude of Fulton Station, west of the meridian of Greenwich, by a mean of the two determinations, - - - - 6 00 39.99

Equal, in arc, to - - - - 90° 09′ 59″.85

Latitude of this station, as before, - - 41° 52′ 01″.33 N.

By the triangulation, based on the true meridian, made in March, 1858, taking our departure from the astronomical station whose position is above given, we obtain the positions of other stations, serving as permanent points of reference, in Fulton, as follows, viz.—

POSITIONS IN THE CITY OF FULTON, ILLINOIS.	North Latitude.	Longitude West of Greenwich.	
		In arc.	In Time.
1. Intersection of the middle of Cherry Street, with the middle of Base Street, - - - - -	° ′ ″ 41 52 03	° ′ ″ 90 10 03	h. m. s. 6 00 40.2
2. Dome of the Dement Hotel, -	41 52 04	90 10 02.35	6 00 40.16
3. Steeple of the Congregational Church, - - - - - - - - -	41 51 59.2	90 09 50.3	6 00 39.35
4. The centre of Washington Square,	41 52 01.8	90 09 38.4	6 00 38.56
5. Foot of Cherry Street, on the east bank of Mississippi river, at high water mark, - - - -	41 52 03	90 10 15.2	6 00 41.01

On Nicollet's map, Fulton is placed in latitude 41° 52′ 43″ N., and longitude 90° 13′ 45″ West of Greenwich, which, in comparison with our result, if we take the centre of Washington Square as the point of reference, is + 41″.2 in latitude, and + 4′ 06″.6 in longitude.

In the last edition (that of 1857) of the map of the territory of the United States, from the Mississippi to the Pacific Ocean, Fulton is laid down in latitude 41° 55′ 27″ N., and in longitude 90° 12′ 19″ W., which, in comparison with our result, is + 3′ 25″ in latitude, and + 2′ 41″ in longitude.

XIV. LYONS, IOWA.

Station.—Near the middle of the garden of Mr. Benjamin Lake's house, on Third Street, at the S. W. corner of Third and Exchange Streets. From the station to the point of intersection of the axes or middles of these two streets, is N. 45° 49′ 30″ E., and the distance is 190 feet.

1*st. Observations for the Latitude.*

Time-stars β Tauri west, and α Bootis (Arcturus) east. Sidereal chronometer fast 1*h.* 00*m.* 31.2*s.* at 9*h.* 57*m.* sidereal. Mean solar chronometer fast 5*m.* 11.4*s.* at 9*h.* 36*m.* mean time.

Latitude of Station. 1858, *March 27th.*

By 22 circum-meridian altitudes of α Hydræ south, and 20 circum-meridian altitudes of α Virginis, also south, combined with 25 circum-meridian altitudes (at lower meridian transit) of Polaris, north, - - - - -	41° 52′ 11″.78
Correction due to the observations for lat. at Fulton, and the survey connecting the two stations,	+ 1.92
Latitude of station adopted, - -	41° 52′ 13″.7 N.

2d. The Longitude.

This we derive from the survey made to connect the Fulton and Lyons stations, thus:—

	° ′ ″	h. m. s.
Longitude of the Fulton Station, as already given, - -	90 09 59.85 =	6 00 39.99
Lyons Station west in longitude, -	+ 44.29 =	+ 2.95
Longitude, deduced, of Lyons Station,	90 10 44.14 =	6 00 42.94
Latitude, as before, - -	41 52 13.7	

Our survey, based on this result, gives two other positions in Lyons, as follows, viz.—

POSITIONS IN THE CITY OF LYONS, IOWA.	North Latitude.	Longitude West of Greenwich.	
		In arc.	In Time.
1. The intersection of the middle of Exchange Street, with the middle of Third Street, - - -	° ′ ″ 41 52 15	° ′ ″ 90 10 42.3	h. m. s. 6 00 42.8
2. The turret of the Female Institute, - - - - - - - - - -	41 52 10.5	90 11 14.5	6 00 44.97

On Nicollet's map, this position is given + 30″ in latitude, and + 5′ 50″ in longitude greater than our observations give for our station, which is nearly central of the city.

On the other map mentioned, it is + 2′ 02″ in latitude, and + 3′ 57″ in longitude greater than ours.

XV. ALBANY, ILLINOIS.

This place is sometimes called "New Albany." It is situated on the eastern shore of the Mississippi river.

Both chronometers were carried from Fulton to Albany and back to Fulton, between the 25th and 28th of March, 1858. Observations were made at Albany on the nights of the 25th and 26th, both for the latitude and the *time*. The longitude of this place is derived from chronometric comparison with the meridian of Fulton.

Station.—From this station to the intersection of the axes of Maple and Main Streets, is S. 48° 51′ 03″ E. (*true*), and the distance is 89 feet.

1st. Observations for the Latitude. 1. 1858, *March 25th.*

By 18 circum-meridian altitudes of α Hydræ, south, combined with 5 altitudes of Polaris, north (clouds prevented more observations on Polaris) - 41° 47′ 23″

2*d.* 1858, *March 26th.*

	° ′ ″
By 23 circum-meridian altitudes, at lower meridian transit, of Polaris, north, combined with 21 circum-meridian altitudes of α Virginis, south, -	41 47 20.2
Latitude of station,—giving the result of the 26th, three times the weight of that of the 25th,	41 47 20.9 N.
Reduction to the point of intersection of the axes of Maple and Main Streets, - - -	— 0.6
Result—Latitude of the point of intersection of the axes of Maple and Main Streets, Albany, Ills.	41 47 20.3 N.

2*d. Observations for the Time.* 1*st.* 1858, *March 25th.*

Sidereal chronometer No. 2557, fast:	*h.* *m.* *s.*
By 6 observations on γ Geminorum, west (at 9*h.* 48*m.*) - - - -	+ 1 00 33.35
By 12 observations on α Bootis, east (at 10*h.* 42*m.*)	+ 1 00 34.87
Result—Chronometer No. 2557, fast of sidereal time for this station (at 10*h.* 15*m.*) -	+ 1 00 34.1
By comparison—Mean Solar chronometer No. 141, was fast of mean solar time for this station (at 10*h.* 00*m.* mean time) - - -	+ 5 23.98

2*d.* 1858, *March 26th.*

Sidereal chronometer No. 2557, fast:	*h.* *m.* *s.*	
By 10 observations on α Leonis (Regulus), west (at 13*h.* 50*m.*) - - - -		+ 1 00 39.17
By 10 observations on α Lyræ, east (at 14*h.* 10*m.*) - -	1 00 38.78	
By 10 observations on α Aquilæ, also east (at 16*h.* 14*m.*) - -	1 00 38.14	
By 20 observations on 2 East Stars, (at 15*h.* 12*m.*) - -	1 00 38.46	
		+ 1 00 38.46

	h.	m.	s.
Result—Chronometer No. 2557, fast of sidereal time for this station (at 14*h*. 31*m*. sidereal)	+ 1	00	38.81
By comparison—Chronometer No. 141, was fast of mean solar time for this station (at 14*h*. 12*m*. mean time)	+ 5	23.05	

Rates of Chronometers from the 24th to the 28th of March, 1858.

Sidereal chronometer No. 2557, gains per sidereal day,	+ 4*s*.14
Mean solar chronometer No. 141, loses per mean solar day,	— 0*s*.637

3d. The Longitude.

Albany Station, west of the meridian of Fulton Station, by the Albany time-observations of March 25th:

	s.
By the run of sidereal chronometer No. 2557,	+ 14.49
By the run of mean solar chronometer No. 141,	+ 14.15
By the Albany time-observations of March 26th:	
By the run of sidereal chronometer No. 2557,	+ 14.32
By the run of mean solar chronometer No. 141,	+ 13.97
Mean of these four results,	+ 14.23

	h.	m.	s.
Longitude of Fulton observing station,	+ 6	00	39.99
Longitude deduced of the Albany observing station,	+ 6	00	54.22
Reduction to the intersection of Maple and Main Streets,			— 0.06
Result—Longitude of the intersection of Maple and Main streets, Albany, Ills., west of the meridian of Greenwich,	6	00	54.16

Equal, in arc, to	90° 13′ 32″.4 W.
Latitude of the same point, as before,	41° 47′ 20″.3 N.

On Nicollet's map, this position is placed in latitude 41° 45′ 37″ N. and in longitude 90° 21′ 52″ W., which differs from our result by — 1′ 43″ in latitude, and + 8′ 30″ in longitude. This place is not laid down on the other map.

A town is now being laid out on the site of an extensive group of

Indian mounds, on the eastern shore of the Mississippi, which is to be called *South Albany*. It is in Illinois, and is situated a little more than a mile below Albany. By our survey, and an observed azimuth of the star Polaris, connected with the above astronomical station, we make the tallest Indian mound, which will be preserved, according to the plan, in the public park of South Albany, in—

Latitude, - - - -	41° 46′ 35″ N.
Longitude, west of Greenwich, - -	6*h*. 00*m*. 56.93*s*.
Equal, in arc, to - - -	90° 14′ 14″ W.

Note.—The west end of the ferry which crosses the stream draining the *Marais des Osiers* (corrupted into "*Meredosia Marshes*" on some of the maps, and into "*Marais d'Ogee*" on others) near the left bank of the Mississippi, on the stage road between Albany and the City of Rock Island, was found, by an offset in our survey between Albany and Camanche, to be in—

Latitude, - - - -	41° 46′ 11″.6 N.
Longitude, - -	6*h*. 00*m*. 59.9*s*. = 90° 14′ 58″.5 W.

XVI. CAMANCHE, IOWA.

This town is situated on the western shore of the Mississippi.

By triangulation from our observing station at Albany, and an observed azimuth of Polaris to obtain the true meridian, we derive the position of Camanche, as follows, viz.—

POSITIONS IN CAMANCHE, IOWA.	Latitude, North.	Longitude west from Greenwich.	
		In Arc.	In Time.
	° ′ ″	° ′ ″	*h*. *m*. *s*.
1. Intersection of Main and Maxan Streets, - - - - - - - - -	41 46 58.9	90 15 10	6 01 00.6
2. Flag-staff on Chicago Street, about 100 yards west of the shore of the Mississippi, - - - -	41 46 51.3	90 15 14.6	6 01 00.97

Nicollet's map gives the latitude of Camanche — 1′ 22″ less, and the longitude + 10′ 20″ greater than the above. He probably had no observing station near this point, but depended on other authorities for its position.

XVII. CITY OF ROCK ISLAND, ILLINOIS.

This city is on the left or *south* bank of the Mississippi river,* which, for a short distance above and opposite this place, flows from east to west in its course. The western terminus of the Chicago and Rock Island Rail Road, is here. The rail-way connects, however, by a bridge across the river, with the City of Davenport, in Iowa, situated on the opposite bank of the river; and, under the name of the *Mississippi and Missouri Rail Road*, runs in a direction about W. N. W. to Iowa City, distant 54 miles from Davenport.

Station.—The centre of Washington Square (called, on some of the maps, Church Square) bounded on the north by Illinois street, on the south by Orleans street, on the east by Madison, and on the west by Jefferson street.

1*st. The Latitude.* 1859, *February* 28*th.*

By 17 circum-meridian altitudes of α Hydræ, south, combined with 20 altitudes of Polaris, north: latitude of station, - - - - 41° 30′ 37″.8

2*d. Observations for the Time.* 1859, *February* 28*th.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h. *m.* *s.*	*h.* *m.* *s.*
By 8 observations on α Arietis, west (at 6*h.* 37*m.*) - -	1 38 38.19	
By 8 observations on γ' Leonis, east (at 6*h.* 56*m.*) - -	1 38 38.06	
1*st Result*—Chronometer fast (at 6*h.* 46½*m.*) - - -	1 38 38.12	+ 1 38 38.12

2*d Set.*

By 10 observations on β Leonis, east (at 8*h.* 04*m.*) - -	1 38 38.59
By 6 observations on α Tauri, and 8 observations on β Tauri, both west (at 8*h.* 26*m.*) - - -	1 38 38.25

* A plan for a city, called "*Rock Island City*," is laid out on Rock river, about 3 miles south of the "*City of Rock Island.*" The two places should not be confounded under names so nearly alike.

	h. m. s.	h. m. s.
2d Result—Chronometer fast (at 8*h.* 15*m.*) - - -	1 38 38.42	
		+ 1 38 38.42
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 7*h.* 31*m.*)		+ 1 38 38.27

Having so good a determination of the *time* by this night's observations, it was a great disappointment, when we went to the telegraph office, to find the communication with Chicago cut off at La Salle, through some misunderstanding there. We were thereby prevented from passing any electric signals this night, but were obliged to wait until the next night.

1859, *March 1st. Same Station.*

	h. m. s.	h. m. s.
Sidereal chronometer No. 2557, fast:		
By 8 observations on α Leonis, east (at 6*h.* 34*m.*) - -	1 38 42.18	
By 9 observations on γ' Leonis, also east (at 7*h.* 04*m.*) - -	1 38 42.22	
By 17 observations on 2 East Stars (at 6*h.* 49*m.*) - -	1 38 42.20 =	+ 1 38 42.20
By 13 observations on α Tauri, west (at 8*h.* 15*m.*)		+ 1 38 42.21
Result—Chronometer No. 2557, fast of sidereal time for this station, (at 7*h.* 32*m.*) -		+ 1 38 42.20

The above observations for the *time* at the City of Rock Island, on the nights of February 28th, and March 1st, give the rate of chronometer No. 2557, for the 24 hours between those dates, + 3*s*.93. This rate applied to the period of the chronometer error of the 1st of March, together with the time observations made at Chicago on the 27th of February and the 4th of March, and the following telegraphic signals, give us the longitude of our "City of Rock Island" station.

Although we returned from Rock Island to Chicago on the evening of March 2d, yet the weather continued so cloudy until the night of the 4th, as to prevent our making earlier observations for the time here.

Thus we have to depend upon five days run of chronometer No. 141, to obtain its rate to be applied to the observations of February 27th, in order to get the Chicago mean solar time of the signals of the 1st of March.

Determination of the difference of Longitude between Chicago and the City of Rock Island, by electric signals for comparisons of time, March 1st, 1859.

Sidereal Chronometer No. 2557, fast, of Rock Island, sidereal time (at 8*h*. 55*m*. 42*s*. sidereal time), 1*h*. 38*m*. 42*s*.43.

Rate per sidereal day, + 3*s*.93; or per sidereal hour, + 0*s*.1637.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 10*h*. 29*m*. 44*s*. mean time), 4*m*. 43*s*.50.

Rate per mean solar day, — 0*s*.008; or per mean solar hour, — 0*s*.0003.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago, by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Rock Island by sidereal Chronometer No. 2557.	Rock Island correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Rock Island west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 25 00	10 29 43.50	10 34 24	8 55 41.57	9 07 27.26	0 11 45.69
10 28 00	10 32 43.50	10 37 24.5	8 58 42.06	9 10 27.75	0 11 45.69
10 31 00	10 35 43.50	10 40 25	9 01 42.56	9 13 28.24	0 11 45.68

1st Mean.—Electric signals sent from Chicago to the City of Rock Island, - - - - - - 0 11 45.687

2d.—Rock Island signals recorded at both stations.

Times of signals given at Rock Island by sidereal Chronometer No. 2557.	Times of Rock Island signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Rock Island signals.	Chicago reduced sidereal time of Rock Island signals.	Rock Island correct sidereal time of Rock Island signals.	Difference of Longitude by each signal.—Rock Island west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 43 25.5	10 34 00	10 38 43.50	9 16 28.74	9 04 43.05	0 11 45.69
10 46 26	10 37 00	10 41 43.50	9 19 29.23	9 07 43.54	0 11 45.69
10 49 26.5	10 40 00	10 44 43.50	9 22 29.72	9 10 44.03	0 11 45.69
10 52 27	10 43 00	10 47 43.50	9 25 30.21	9 13 44.52	0 11 45.69

2d Mean.—Electric signals sent from the City of Rock Island to Chicago, - - - - - - 0 11 45.690

1st Mean.—Electric signals sent from Chicago to the City of Rock Island, as above, - - - - - 0 11 45.687

Result:—Rock Island Station is west, in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - - + 0 11 45.69

	h.	m.	s.
Brought forward,	+ 0	11	45.69
Longitude of Chicago station No. 3, - -	+ 5	50	31.20

Determination 1st.

Longitude of the centre of Washington Square in the City of Rock Island, west of the meridian of Greenwich, - - - - -	6	02	16.89

P. S. Since presenting the above result, I made, on the 29th of July, 1859, another visit to the City of Rock Island. It was made the occasion of a second determination of the longitude of that place, depending on the time-observations at Chicago given under the dates of July 28th and 31st, the time-observations at the City of Rock Island of July 29th, as given below, and the electric signals of that night. The observations at the same Rock Island Station which was before occupied, were as follows, viz.—

1*st. Observations for the Time.* 1859, *July 29th. At the centre of Washington Square.*

Sidereal chronometer No. 2557, fast:	h.	m.	s.
By 3 observations on ε Bootis, west (at 18*h*. 08*m*.)	+ 1	57	25.19
By 4 observations on ζ Cygni, east (at 18*h*. 18*m*. 40*s*.)	+ 1	57	25.63
Result—Chronometer No 2557, fast of sidereal time for this station (at 18*h*. 13*m*. 20*s*.)	+ 1	57	25.41

The night was cloudy, but the sky opened clear just long enough to enable us to make the few observations above recorded. They were worked separately and the results were satisfactory. The extreme difference, for chronometer error, in the three on ε Bootis, west, being 0*s*.33 and in the four on ζ Cygni, east, being 1*s*.03. The extreme difference in three (the first not being counted) on ζ Cygni, is 0*s*.47. They were all, however, taken into the count.

These stars being nearly of the same declination, north, (ε Bootis 27° 40′ and ζ Cygni 29° 39′), the result for the time at Rock Island, this night, may, we think, be considered satisfactory.

The elapsed time between the Chicago observations which apply to the first determination (that of March 1st), was five days. That between the Chicago observations which enter into the calculation of this second determination, is only three days. Considering all circumstances we are inclined to assign equal weight to the two determinations. The second one is as follows, viz:—

Determination of the difference of Longitude between Chicago and the City of Rock Island, Illinois, by electric signals for comparisons of time, July 29th, 1859.

Sidereal Chronometer No. 2557, fast, of Rock Island sidereal time (at 19*h*. 53*m*. 36*s*. sidereal time), 1*h*. 57*m*. 25*s*.94.

Rate per sidereal day, + 7*s*.61; or per sidereal hour, + 0*s*.317.

Mean Solar Chronometer No. 141, slow, of Chicago, mean solar time (at 11*h*. 36*m*. mean time), 1*h*. 57*m*. 25*s*.94.

Rate per mean solar day, — 0*s*.755; or per mean solar hour, — 0*s*.03146.

1st.—Chicago signals recorded at both stations.

Times of Signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals as noted at Rock Island by sidereal Chronometer No. 2557.	Rock Island correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal. City of Rock Island west of the meridian of Chicago observing station No.3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
11 31 00	11 36 04.19	21 51 02	19 53 36.06	20 05 22.29	0 11 46.23
11 34 00	11 39 04.19	21 54 02.5	19 56 36.55	20 08 22.78	0 11 46.23
11 36 50	11 41 54.19	21 56 53	19 59 27 03	20 11 13.25	0 11 46.22

1st Mean.—Electric signals sent from Chicago to the City of Rock Island, - - - . - - 0 11 46.227

2d.—The City of Rock Island signals recorded at both stations.

Times of signals given at Rock Island by sidereal Chronometer No. 2557.	Times of Rock Island signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Rock Island signals.	Chicago reduced sidereal time of Rock Island signals.	Rock Island correct sidereal time of Rock Island signals.	Difference of Longitude by each signal.— City of Rock Island west of the meridian of Chicago observing station No.3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
22 02 44	11 42 40	11 47 44.20	20 17 04.22	20 05 18.00	0 11 46.22
22 05 44.5	11 45 40	11 50 44.20	20 20 04.71	20 08 18.48	0 11 46.23
22 08 45	11 48 40	11 53 44.20	20 23 05.21	20 11 18.97	0 11 46.24

2d Mean.—Electric signals sent from the City of Rock Island to Chicago, - - - - - - 0 11 46.23

1st Mean.—Electric signals sent from Chicago to the City of Rock Island, as above - - - - - 0 11 46.227

Result:—The centre of Washington Square in the City of Rock Island is west, in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - + 0 11 46.228

	h.	m.	s.
Brought forward	+ 0	11	46.23
Longitude of Chicago Station No. 3, -	+ 5	50	31.20

2d Determination. July 29th, 1859.

Longitude of centre of Washington Square, in the City of Rock Island, - - - -	6	02	17.43
1*st Determination, March 1st*, 1859, - -	6	02	16.89

Result, giving each Determination an equal weight:

Longitude of the centre of Washington Square, in the City of Rock Island, Illinois, west of the meridian of Greenwich, - - - -	6	02	17.16
Equal, in arc, to - - -	90°	34′	17″.4 W.
Latitude of the same station, as before given,	41°	30′	37″.8 N.

By survey, departing from this station, based on an observed azimuth of the sun on the 2d of March, 1859, for comparing our courses with the true meridian, we obtained the positions of other points, in the City of Rock Island, which may be useful for future reference. We give them all in the following table, viz.—

POSITIONS IN THE CITY OF ROCK ISLAND, ILLINOIS.	Latitude North.	Longitude west of Greenwich.	
		In Arc.	In Time.
	° ′ ″	° ′ ″	h. m. s.
1. Centre of Washington Square,	41 30 37.8	90 34 17.4	6 02 17.16
2. Dome of the Court House on Orleans Street, between Elk and Deer Streets, - - - - - -	41 30 33.7	90 34 42.3	6 02 18.82
3. Steeple of the 2d Presbyterian Church, on Illinois Street, between Elk and Deer Streets, -	41 30 37.4	90 34 43.7	6 02 18.91
4. Intersection of Jefferson and Orleans Streets, - - - - -	41 30 35.9	90 34 19.9	6 02 17.33
5. Passenger house of the depot at the western terminus of the Chicago and Rock Island Rail Road,	41 30 41	90 34 12.8	6 02 16.85

On the War Department map of 1857, the City of Rock Island is laid down in latitude 41° 28′ 39″ N., and longitude 90° 39′ 13″ W.; which is 2 minutes of latitude less, and 4′ 31″ more, in longitude, than our observations give.

Note.—By applying a transcript from the Land Office Surveys, contained in C. H. Stoddard's map of Scott county, Iowa, and Rock

Island county, Illinois—published in 1857, on a scale of 1 mile to 1 inch— to our Station XVII., we obtain the approximate positions of several places in the vicinity, as follows, viz.—

NAMES OF PLACES.	North Latitude.	Longitude west from Greenwich.	
		In Arc.	In Time.
	° ′ ″	° ′ ″	*h. m. s.*
1. Rock Island City, Illinois, - -	41 28 14.3	90 35 06	6 02 20.4
2. Mouth of Rock River; the west extremity of the island in the mouth of said river, - - - -	41 29 01.3	90 35 53	6 02 23.5
3. Moline. The south end of the bridge connecting with Rock Island, - - - - - - - - - -	41 30 37	90 30 49	6 02 03.3
4. Watertown, - - - - - -	41 32 19.6	90 25 02	6 01 40.1

XVIII. FORT ARMSTRONG, ILLINOIS.

This old fort is situated on the point at the west or lowest extremity of Rock Island; an island in the Mississippi river, between the "City of Rock Island" and the City of Davenport.

By Hogane & Lambach's map of the City of Davenport, published in 1857, on a scale of 9 inches to 1 mile, or 586⅔ feet to the inch; and on C. H. Stoddard's map of the cities of Rock Island, in Illinois, and Davenport in Iowa, published in 1851, on a scale of 13.2 inches to 1 mile, or 400 feet to the inch,—scales which admit of minute measurements of courses and distances, Fort Armstrong is laid down in reference to the centre of Washington Square, in the City of Rock Island, our astronomical station, XVII., as follows, respectively, viz.—

	Latitude North of Station XVII.	Longitude East of Station XVII.	
		In Arc.	In Time.
By Hogane & Lambach's map of 1857, - - - - - - - - - -	+ 20″.93	— 22″.87	*s.* — 1.524
By Stoddard's map of 1851, - -	+ 23.17	— 25.46	— 1.697
Mean of the two maps in reference to Station XVII. - - - - - -	+ 22″.05	— 24″.16	*s.* — 1.61
Position of Station XVII., by our determination, - - - - - -	+ 41 ° 30 ′ 37″.8	+ 90 ° 34 ′ 17″.4	*h. m. s.* + 6 02 17.16

	North Latitude.	Longitude West of the meridian of Greenwich.	
		In Arc.	In Time.
	° ′ ″	° ′ ″	*h. m. s.*
Position of Fort Armstrong, Ills., deduced, - - - - - - - - -	41 30 59.8	90 33 53.2	6 02 15.55
Davenport's House on Rock Island, - - - - - - - - - -	41 31 18.7	90 33 19.7	6 02 13.04

In Captain Andrew Talcott's report on the Ohio and Michigan boundary, made in January, 1834, he gives the position of Fort Armstrong to be in latitude 41° 31′ 09″.7 N., and longitude 90° 27′ 15″* = in time to 6*h*. 01*m*. 49*s*., exceeding us in the latitude, say 10″, and falling short of us in the longitude 26*s*.55 in time = 6*m*. 38*s*.25 in arc = 5.736 miles.

On Nicollet's map, the lower extremity of Rock Island (occupied by Fort Armstrong), is laid down 1′ 20″ in latitude less, and 8′ of longitude, = 6.91 miles more than our observations indicate. On the last War Department map (of 1857), it is laid down in latitude 35″ of latitude south, and 5′ 24″ in longitude west of the position given by our observations.

XIX. DAVENPORT, IOWA.

This beautiful city occupies the height and slope of an eminence, on the right bank of the Mississippi river, immediately opposite to the City of Rock Island, Illinois.

A mean, derived from courses and distances measured on Stoddard's map of 1851, and Hogane & Lambach's map of 1857, mentioned before, and referred to our astronomical station XVII., gives us as follows, in regard to Davenport, Iowa, viz.—

POSITIONS IN THE CITY OF DAVENPORT, IOWA.	North Latitude.	Longitude West from Greenwich.	
		In Arc.	In Time.
1. The intersection of the middle of Brady Street with the middle of Fourth Street, - - - - -	° ′ ″ 41 31 22.9	° ′ ″ 90 34 25.2	*h*. *m*. *s*. 6 02 17.7
2. Centre of the Court House, occupying the centre of the square, bounded on the north by Fifth Street, on the south by Fourth, on the east by Ripley, and on the west by Scott Street, - - - -	41 31 24.8	90 34 43	6 02 18.9

On Nicollet's map, Davenport is placed 18″ in latitude south, and 7′ 37″ in longitude west of our position, derived from the preceding observations.

On the War Department map of 1857, it is placed 16 seconds of latitude south, and 6 minutes and 5 seconds of longitude west of the position which our observations assign to it.

* Erroneously printed 90° 26′ 15″ in his report, as contained in Doc. No. 497, of the House of Representatives, 23d Congress, 1st Session. See page 6 of that document.

XX. NEW BUFFALO, MICHIGAN.

This place is situated on the south east shore of lake Michigan, nearly opposite to Chicago.

Station.—In Mr. Joshua R. C. Brown's garden. From this station to the point of intersection of the axes of Whitaker Avenue and Mechanics Street, is S. 5° 12′ W. (true) 106 feet.

1st. The Latitude. 1859, *May* 23*d.*

	°	′	″	
By 35 circum-meridian altitudes of α Virginis, south, combined with 32 altitudes of Polaris (α Ursæ Minoris) north; latitude of station, - -	41	47	48	N.
Reduction to the intersection of the axes of Whitaker Avenue and Mechanics Street, - -			— 1	
Latitude of the point of intersection of Whitaker Avenue and Mechanics Street, - -	41	47	47	N.

2d. Observations for the Time. 1*st.* 1859, *March* 16*th.*

	h.	*m.*	*s.*	
Sidereal chronometer No. 2557, fast:				
By 3 observations on α Tauri, west (at 8*h.* 42*m.*) - - -	1	25	07.46	
By 8 observations on Capella (α Aurigæ), also west (at 9*h.* 04*m.*)	1	25	07.37	
By 11 observations on 2 West Stars, giving weight according to the number of observations on each, (at 8*h.* 53*m.*) - - -	1	25	07.42	
				+ 1 25 07.42*
By 10 observations on α Bootis, east (at 9*h.* 44*m.*)				+ 1 25 09.18*
Result—Chronometer No. 2557, fast of sidereal time for this station (at 9*h.* 19*m.*) - -				+ 1 25 08.30

Clouds prevented the selection of the best time-stars; and none were visible for the latitude.

* Here it is evident that too great an index error for the sextant was used in computing the altitudes for the time by the East and West stars. That error had changed since last observed, which is the cause of the difference of results East and West;—the west observations giving too little, by an unknown quantity, and the east observations giving too much by the same quantity. The mean of the two results eliminates the error, and gives the correct time as reported. J. D. G.

3d. *The Longitude.*

This result for the New Buffalo time, and the results of the time-observations at Chicago on the nights of the 15th and 19th of March, —which last was the earliest date after our return to Chicago from New Buffalo, that observations could be made, owing to bad weather— combined with the following telegraphic signals, give us our 1st determination of the longitude of New Buffalo, viz.—

Determination of the difference of Longitude between Chicago and New Buffalo, Michigan, by electric signals for comparisons of time, March 16th 1859.

Sidereal Chronometer No. 2557, fast, of New Buffalo sidereal time (at 10*h*. 34*m*. 28*s*. sidereal time), 1*h*. 25*m*. 08*s*.66.

Rate per sidereal day, + 6*s*.793; or per sidereal hour, + 0*s*.283.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 10*h*. 54*m*. mean time), 4*m*. 40*s*.25.

Rate per mean solar day, — 0*s*.094; or per mean solar hour, — 0*s*.0039.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Cbicago signals.	Times of Chicago signals, as noted at New Buffalo by sidereal Chronometer No. 2557.	New Buffalo correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.— New Buffalo station is east of the meridian of Chicago observing station No.3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 49 20	10 54 00.25	11 59 36.5	10 34 27.84	10 30 56.30	0 03 31.54
10 52 20	10 57 00.25	12 02 37	10 37 28.33	10 33 56.79	0 03 31.54
11 13 20	11 18 00.25	12 23 40.5	10 58 31.73	10 55 00.24	0 03 31.49
11 16 20	11 21 00.25	12 26 41	10 01 32.22	10 58 00.73	0 03 31.49
1st Mean.—Electric signals sent from Chicago to New Buffalo,					0 03 31.52

2d.—New Buffalo signals recorded at both stations.

Times of signals given at New Buffalo by sidereal Chronometer No. 2557.	Times of New Buffalo signals, as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of New Buffalo signals.	Chicago reduced sidereal time of New Buffalo signals.	New Buffalo correct sidereal time of New Buffalo signals.	Difference of Longitude by each signal.— New Buffalo station is east of the meridian of Chicago observing station No.3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
12 05 37.5	10 55 20	11 00 00.25	10 36 57.28	10 40 28.82	0 03 31.54
12 08 38	10 58 20	11 03 00.25	10 39 57.77	10 43 29.31	0 03 31.54
12 32 42	11 22 20	11 27 00.25	11 04 01.72	11 07 33.19	0 03 31.47
12 35 42.5	11 25 20	11 30 00.25	10 07 02.21	11 10 33.68	0 03 31.47
12 38 43	11 28 20	11 33 00.25	11 10 02.70	11 13 34.16	0 03 31.46

2d Mean.—Electric signals sent from New Buffalo to Chicago, 0 03 31.516
1st Mean.—Electric signals sent from Chicago to New Buffalo, as above, - - - - - - - - 0 03 31.520

Result:—New Buffalo Observing Station is east, in longitude, of Chicago observing station No. 3, by a mean of the two sets of signals, - - - - - — 0 03 31.518

	h.	*m.*	*s.*
Longitude of Chicago Station No. 3, -	+ 5	50	31.20

1st Determination.

Longitude of New Buffalo Station, west of the meridian of Greenwich, - - - -	5	46	59.68

On the 19th of May, I found I should be obliged to visit New Buffalo harbour again, so I determined to make it the occasion of another trial of the difference of longitude between that place and Chicago. For this purpose the observations, as recorded, were made at Chicago on the night of the 19th; and also on the night of the 21st, on my return from New Buffalo. The night of the 20th was spent at New Buffalo, where the following time-observations were made at the same station as before, viz.—

1859, *May 20th.*—Sidereal chronometer No. 2557, fast of New Buffalo sidereal time:

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 3 observations on α Coronæ Borealis, east (at 12*h.* 51*m.*) -	1	33	13.59			
By 8 observations on ζ Hercules, also east (at 13*h.* 54*m.*) - -	1	33	13.21			
By 11 observations on 2 East Stars, giving weight according to the number on each (at 13*h.* 22*m.*)	1	33	13.31			
				+ 1	33	13.31
By 5 observations on γ' Leonis, west, (at 13*h.* 40*m.*)				+ 1	33	12.52
Result—Chronometer No. 2557, fast of New Buffalo sidereal time (at 13*h.* 29*m.*) -				+ 1	33	12.91

The night was not favourable for observation. The sky was much clouded, which again prevented a selection of the best time-stars. Those that were observed on were caught, at favourable moments, be-

tween passing clouds, and fewer observations were obtained than was desirable for a close determination of the time.

A set of observations was obtained on α Virginis, S., for the latitude; but Polaris, North, was hidden from view, and the result from meridian observations, on only one side of the zenith, being considered imperfect for a close approximation, they were not used.

The Longitude.

A second determination of the longitude of this station, is derived from the above time-observations, made at New Buffalo; combined with those at Chicago on the nights of May 19th and 21st, and the telegraphic signals, as follows, viz.—

Determination of the difference of Longitude between Chicago and New Buffalo, Michigan, by electric signals for comparisons of time, May 20th, 1859.

Sidereal Chronometer No. 2557, fast, of New Buffalo sidereal time (at 14*h*. 23*m*. 29*s*. sidereal time), 1*h*. 33*m*. 13*s*.17.

Rate per sidereal day, + 6*s*.966; or per sidereal hour, + 0*s*.29.

Mean solar Chronometer No. 141, slow, of Chicago mean solar time (at 10*h*. 26*m*. 51*s*. mean time), 4*m*. 40*s*.65.

Rate per mean solar day, — 0*s*.47; or per mean solar hour, — 0*s*.0196.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at New Buffalo by sidereal Chronometer No. 2557.	New Buffalo correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—New Buffalo station is east of the meridian of Chicago observing station No.3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 22 10	10 26 50.65	15 56 43	14 23 29.83	14 19 58.31	0 03 31.52
10 25 10	10 29 50.65	15 59 43.5	14 26 30.31	14 22 58.80	0 03 31.51
10 37 10	10 41 50.65	16 11 45.5	14 38 32. 5	14 35 00.77	0 03 31.48
10 40 10	10 44 50.65	16 14 46	14 41 32.74	14 38 01.26	0 03 31.48
10 43 10	10 47 50.65	16 17 46.5	14 44 33.23	14 41 01.75	0 03 31.48

1st Mean.—Electric signals sent from Chicago to New Buffalo, 0 03 31.494

2d.—New Buffalo signals recorded at both stations.

Times of signals given at New Buffalo by sidereal Chronometer No. 2557.	Times of New Buffalo signals, as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of New Buffalo signals.	Chicago reduced sidereal time of New Buffalo signals.	New Buffalo correct sidereal time of New Buffalo signals.	Difference of Longitude by each signal.—New Buffalo station is east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
16 20 47	10 46 10	10 50 50.65	14 44 02.25	14 47 33.71	0 03 31.46
16 23 47.5	10 49 10	10 53 50.65	14 47 02.74	14 50 34.20	0 03 31.46
16 26 47	10 52 09	10 56 49.65	14 50 02.73	14 53 33.68	0 03 31.45
16 29 48 5	10 55 10	10 59 50.65	14 53 03.73	14 56 35.17	0 03 31.44
16 39 49	10 58 10	11 02 50.65	14 56 04 22	14 59 35.66	0 03 31.44
2d Mean.—Electric signals sent from New Buffalo to Chicago,					0 03 31.45
1st Mean.—Electric signals sent from Chicago to New Buffalo, as above, - - - - - - -					0 03 31.49

Result:—New Buffalo Observing Station is east, in longitude, of Chicago observing station No. 3, by a mean of the two sets of signals, - - - - - - — 0 03 31.47

Longitude of Chicago Station No. 3, - + 5 50 31.20

2d Determination.

Longitude of New Buffalo Station, - + 5 46 59.73

We have here two satisfactory results for the longitude; but the unfavourable state of the sky on both nights prevented a satisfactory determination of the latitude of this station. A third visit, made on the 23d of May, gave an opportunity for a third trial of the difference of longitude between this place and Chicago, and for observing for the latitude. The night, this time, was clear, and good pairs of stars, both for the time and the latitude, were selected. Those for the latitude, and the result, are already given at the beginning of this article, XVIII.

Observations for the Time. 1859, *May* 23*d.*

Sidereal chronometer No. 2557, fast of New Buffalo sidereal time:

	h.	*m.*	*s.*
By 12 observations on α Coronæ Borealis, east (at 12*h.* 19*m.*) - - - -	+ 1	33	33.47
By 13 observations on ϵ Leonis, west (at 12*h.* 41*m.*)	+ 1	33	33.64
Result—Chronometer No. 2557, fast of New Buffalo sidereal time (at 12*h.* 30*m.*) - -	+ 1	33	33.55

The Longitude.

The above result for the New Buffalo time, and the observations of the 22d and 24th of May, for the Chicago time, combined with the following telegraphic signals, give us a third result for the longitude, as follows, viz.—

Determination of the Difference of Longitude between Chicago and New Buffalo, Michigan, by electric signals for comparisons of time, May 23d, 1859.

Sidereal Chronometer No. 2557, fast, of New Buffalo sidereal time (at 15*h*. 11*m*. 27*s*. sidereal time), 1*h*. 33*m*. 34*s*.71.

Rate per sidereal day, + 7*s*.351; or per sidereal hour, + 0*s*.3063.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 11*h*. 02*m*. 52*s*. mean time), 4*m*. 41*s*.76.

Rate per mean solar day, + 0*s*.02764; or per mean solar hour, + 0*s*.00115.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at New Buffalo by sidereal Chronometer No. 2557.	New Buffalo correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—New Buffalo station is east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 58 10	11 02 51.62	16 45 01.5	15 11 26.79	15 07 54.86	0 03 31.93
11 01 10	11 05 51.62	16 48 02	15 14 27.27	15 10 55.35	0 03 31.92
11 04 10	11 08 51.62	16 51 02 5	15 17 27.76	15 13 55.85	0 03 31.91
11 22 30	11 26 41.62	17 08 55.5	15 35 20.66	15 31 48.78	0 03 31.88
11 25 00	11 29 41.62	17 11 56	15 38 21.15	15 34 49.27	0 03 31.88

1st Mean.—Electric signals sent from Chicago to New Buffalo, 0 03 31.908

2d.—New Buffalo signals recorded at both stations.

Times of signals given at New Buffalo by sidereal Chronometer No. 2557.	Times of New Buffalo signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago coreect mean solar time of New Buffalo signals.	Chicago reduced sidereal time of New Buffalo signals.	New Buffalo correct sidereal time of New Buffalo signals.	Difference of Longitude by each signal.—New Buffalo station is east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
16 54 06.5	11 07 13.5	11 11 55.12	15 16 59.85	15 20 31.74	0 03 31.89
16 57 08.5	11 10 15	11 14 56.62	15 20 01.85	15 23 33.73	0 03 31.88
17 00 09	11 13 15	11 17 56.62	15 23 02.34	15 26 34.21	0 03 31.87

2d Mean.—Electric signals sent from New Buffalo to Chicago, 0 03 31.88

1st Mean.—Electric signals sent from Chicago to New Buffalo, as above, - - - - - - - - 0 03 31.908

Result:—New Buffalo Observing Station is east, in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - — 0 03 31.894

	h.	m.	s.
Brought forward,	— 0	03	31.89
Longitude of Chicago Station No. 3, -	+ 5	50	31.20

3d Determination.

Longitude of New Buffalo Station, -	+ 5	46	59.31

SUMMARY.—*Longitude of this Station:*

By determination 1st, of March 16th, 1859, -	5	46	59.68
By determination 2d, of May 20th, 1859, -	5	46	59.47
By determination 3d, of May 23d, 1859, - -	5	46	59.89

Mean, giving double weight to the last.

Longitude of New Buffalo Station, west of the meridian of Greenwich, - - -	5	46	59.78
Equal, in arc, to - - -	86°	44′	56″.7 W.
Latitude of this station, as before, - -	41°	47′	48″ N.

The above results, connected with observed azimuths of the sun, and distances determined by triangulation in our survey of this harbour, made in September, 1857, (see map G. No. 57), give the positions of other points in New Buffalo, as follows, viz.—

POSITIONS IN NEW BUFFALO, MICHIGAN.	Latitude North.	Longitude West of Greenwich.	
		In arc.	In Time.
	° ′ ″	° ′ ″	h. m. s.
1. Intersection of Whitaker Avenue and Mechanics Street (centre),	41 47 47	86 44 56.8	5 46 59.8
2. Passenger house of the Michigan Central Rail Road Station (centre), - - - - - - - - - -	41 47 47.1	86 45 01.4	5 47 00.09
3. Intersection of the middle of Merchant's Street with the middle of Brown Street, - - - - -	41 47 33.1	86 45 16.8	5 47 01.12
4. The Light House, - - - - -	41 47 43.5	86 45 37.4	5 47 02.49

In Colton's map of the United States, of 1851, this place is laid down in latitude 41° 51′ 30″ N., and in longitude 86° 42′ West.

XXI. NILES, MICHIGAN.

Station.—In the yard in the rear of the Methodist Church, near the N. W. corner of Fourth and Main Streets. From this station to the intersection of the middle of Main Street, with the middle of Fourth Street, is S. 22° 31′. E. 221 feet.

1*st. Observations for the Latitude.* 1859, *June* 8*th.*

By 14 altitudes of Polaris, north, combined with 2 altitudes of α Virginis S., observed at 16 and 21 minutes of time after meridian passage, we get:

Latitude of station (approximate), - -	41° 49′ 56″
Reduction to the point of intersection of Main and Fourth streets, - - - -	— 2″
Latitude (approximate) of the intersection of Main and Fourth streets, - - -	41° 49′ 54″ N.

The sky to the south was so cloudy, that a satisfactory set of observations on a star passing the meridian to the south of our station, could not be obtained to combine with those on Polaris, north, for the latitude. The index error of the sextant had, however, been very carefully measured on the day of these observations, and hence we believe that the latitude, here stated, is within four or five seconds of the truth, which is quite near enough for satisfactory results in computing the time from altitudes of East and West Stars, two sets of which were obtained to-night.

2*d. Observations for the Time.*

Sidereal chronometer No. 2557, fast:

1*st Set.*

	h.	*m.*	*s.*			
By 12 observations on γ' Leonis, west (at 14*h.* 02*m.*) - - -	1	33	36.16			
By 11 observations on α Lyræ, east (at 15*h.* 06*m.*) - - -	1	33	36.29			
1*st Result*—Chronometer No. 2557, fast (at 14*h.* 34*m.*) - -	1	33	36.22	*h.*	*m.*	*s.*
				+ 1	33	36.22

2*d Set.*

By 11 observations on β Cygni, east (at 15*h.* 29*m.*) - - -	1	33	36.55			
By 9 observations on ε Bootis, west (at 18*h.* 06*m.*) - - -	1	33	36.92			
2*d Result*—Chronometer No. 2557, fast (at 18*h.* 06*m.*) - -	1	33	36.73			
				+ 1	33	36.73

	h.	m.	s.
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 15*h*. 40*m*.)	+ 1	33	36.47

This determination of the time, I consider very satisfactory. The difference between the results by the East and West Stars, is, in each set, very nearly correspondent with the known rate of the chronometer during the elapsed time; which shows that the total arc measured in each case was actually what the limb of the sextant, after applying the measured index error, reported. Hence the 14 altitudes of the star Polaris, observed for the latitude, probably gave a pretty close result, independent of a south star for eliminating errors of observation.

3*d*. *The Longitude.*

From the time-observations made at Chicago, on the 6th and 10th of June, and those of the 8th, at Niles, and the telegraphic signals of the 8th, we derive the longitude, as follows, viz.—

Determination of the difference of Longitude between Chicago and Niles, Michigan, by electric signals for comparisons of time, June 8th, 1859.

Sidereal Chronometer No. 2557, fast, of Niles sidereal time (at 16*h*. 46*m*. 37*s*. sidereal time), 1*h*. 33*m*. 36*s*.78.

Rate per sidereal day, + 6*s*.6688; or per sidereal hour, + 0*s*.2778.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 11*h*. 32*m*. 56*s*. mean time), 4*m*. 45*s*.72.

Rate per mean solar day, — 0*s*.443; or per mean solar hour, — 0*s*.01845

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago, by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Niles by sidereal Chronometer No 2557.	Niles correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Niles east of the meridian of Chicago observing station No. 3.
h. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.	*h*. *m*. *s*.
11 28 10	11 32 55.72	18 20 14	16 46 37.22	16 41 08.83	0 05 28.39
11 31 10	11 35 55.72	18 23 14.5	16 49 37.71	16 44 09.32	0 05 28.39
11 34 10	11 38 55.72	18 26 15	16 52 38.20	16 47 09.83	0 05 28.37
11 46 10	11 50 55.72	18 38 17	17 04 40.14	16 59 11.79	0 05 28.35
1st Mean.—Electric signals sent from Chicago to Niles,					0 05 28.375

2d.—Niles signals recorded at both stations.

Times of signals given at Niles by sidereal Chronometer No. 2557.	Times of Niles signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Niles signals.	Chicago reduced sidereal time of Niles signals.	Niles correct sidereal time of Niles signals.	Difference of Longitude by each signal.—Niles east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
18 29 15.5	11 37 10	11 41 55.72	16 50 10.31	16 55 38.68	0 05 28.37
18 32 16	11 40 10	11 44 55.72	16 53 10.80	16 58 39.17	0 05 28.37
18 35 16.5	11 43 10	11 47 55.72	16 56 11.29	17 01 39.65	0 05 28.36

2d Mean.—Electric signals sent from Niles to Chicago, - 0 05 28.367

1st Mean.—Electric signals sent from Chicago to Niles, as above, - - - - - - - 0 05 28.375

Result:—Niles Observing Station is east, in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - — 0 05 28.37

Longitude of Chicago station No. 3, - - + 5 50 31.20

Longitude of Niles observing station west of the meridian of Greenwich, - - - - 5 45 02.83

Equal, in arc, to - - - 86° 15′ 42.45″

Latitude (approximate) of this station, as before given, 41° 49′ 56″ N.

By a careful survey, connected with this determination, we derive the positions of other points in Niles, as follows, viz.—

POSITIONS IN NILES.	Latitude, North.	Longitude west of Greenwich.	
		In Arc.	In Time.
	° ′ ″	° ′ ″	*h. m. s.*
1. Intersection of Main and Fourth Streets, - - - - - - - - -	41 49 54	86 15 41.3	5 45 02.75
2. Steeple of Trinity Church (Episcopal) at the S. E. corner of Broadway and Fourth Streets, -	41 49 46.1	86 15 40.1	5 45 02.67
3. Steeple of the Presbyterian Ch. on Fourth Street, between Broadway and Cherry Streets, - -	41 49 44.3	86 15 40.1	5 45 02.67
4. Foot of Main Street, on the east bank of St. Joseph river, - -	41 49 54	86 15 57.7	5 45 03.85

The 4th or last point given in the above tabulation, is the station where Captain Andrew Talcott observed in the year 1833. It was pointed out by Mr. William B. Beeson, who resided here at the time.

At page 6 of Doc. 497, House of Representatives, 23d Congress, 1st Session, Captain Talcott states its position to be:

Latitude, - - - -	41° 50′ 09″ N.
Longitude west of the meridian of Greenwich,	86° 06′ 28″.5 W.
Or, in Time, - - - -	5*h*. 44*m*. 25*s*.9

Our observations place this station 15″ in latitude, south, and 38 seconds of time, or 9′ 30″ of arc, in longitude, west of the position assigned to it by Captain Talcott.

Time Observations at Toledo, Ohio.

We now adopt Toledo, as our meridian of comparison, for determining the longitudes of places eastward of it.

By reference to our Station IX., it will be seen that our observing station here was determined to be in:

Latitude, - - - -	41° 39′ 02″.26 N.
Longitude, - - - -	5*h*. 34*m*. 09*s*.57 W.

The time-observations made at this station for comparison with those made at other stations, were as follows, viz.—

1st. 1859, *January 18th*. *At Toledo Station.*

	h. *m*. *s*.	*h*. *m*. *s*.
Sidereal chronometer No. 2557, fast:		
By 9 observations on ∝ Andromedæ, west, (at 3*h*. 49*m*.) - -	1 06 04.99	
By 6 observations on β Andromedæ, also west (at 4*h*. 25*m*.) -	1 06 04.96	
By 15 observations on 2 West Stars, (at 4*h*. 07*m*.) - -	1 06 04.98	+ 1 06 04.98
By 10 observations on β Geminorum, east (at 4*h*. 08*m*.) - - - -		+ 1 06 05.78
Result—Chronometer No. 2557, fast of Toledo sidereal time (at 4*h*. 07*m*. 30*s*.) -		+ 1 06 05.38
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 8*h*. 16*m*. mean time) - - - - -		— 20 50.63

2d. 1859, *January* 21*st.* *Same Station.*

Sidereal chronometer No. 2557, fast:

1st Set.

	h.	*m.*	*s.*	*h.*	*m.*	*s.*
By 13 observations on β Geminorum, east (at 4*h.* 39*m.* 30*s.*)	1	06	23.07			
By 2 observations on α Andromedæ, and also 10 observations on β Andromedæ, both west (at 4*h.* 08*m.*)	1	06	22.84			
1*st Result*—Chronometer fast (at 4*h.* 54*m.*)	1	06	22.95	+ 1	06	22.95

2d Set.

By 5 observations on α Leonis, and 2 observations on β Leonis, both east, (at 7*h.* 46*m.*)	1	06	23.62			
By 9 observations on α Tauri, west (at 7*h.* 48*m.*)	1	06	22.84			
2*d Result*—Chronometer fast (at 7*h.* 47*m.*)	1	06	23.23	+ 1	06	23.23
Result adopted.—Chronometer No. 2557, fast of Toledo sidereal time, (at 6*h.* 20*m.*) by giving weight according to the number of observations in each set,				+ 1	06	23.04
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 10*h.* 16*m.* mean time)				— 20	50.38	

3d. 1859, *January* 24*th.* *Same Station.*

Sidereal chronometer No. 2557, fast:

	h.	*m.*	*s.*
By 10 observations on β Geminorum, east (at 3*h.* 40*m.*)	+ 1	06	36.14
By 10 observations on α Andromedæ, west (at 4*h.* 03*m.*)	+ 1	06	36.10

	h.	m.	s.
Result—Chronometer No. 2557, fast of Toledo sidereal time (at 3*h*. 51*m*.) - -	+ 1	06	36.12
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 7*h*. 36*m*. mean time) - - - - -	— 20	58.04	

4*th*. 1859, *January* 26*th*. *Same Station.*

Sidereal chronometer No. 2557, fast:			
By 5 observations* on β Geminorum, east (at 3*h*. 46*m*.) - - - -	+ 1	06	44.77
By 13 observations on α Andromedæ, west (at 4*h*. 18*m*.) - - - -	+ 1	06	45.44
Result—Chronometer No 2557, fast of Toledo sidereal time (at 4*h*. 02*m*.) -	+ 1	06	45.1
By comparison—Chronometer No. 141, was slow of mean solar time for this station (at 7*h*. 39*m*. mean time) - - - - -	— 20	59.04	

1*st*. *Rates of the Chronometers.*

The rates of the chronometers, between the 18th and 26th of January, 1859, are given below, for use in computing the longitudes of Elyria, Cleveland, and Columbus, Ohio, with reference to the meridian of our Toledo observing station, as follows, viz.—

Rates of Sidereal Chronometer No. 2557.

1859.		Elapsed Sidereal interval.	Rate per 24 Sidereal hours.
From	To	Days and Decimals.	Gaining.
			s.
January 18,	January 21,	3.092	+ 5.710
January 21,	January 24,	2.896	+ 4.517
January 24,	January 26,	2.007	+ 4.473

* The sky became suddenly clouded in the east, and no more observations could be made in that direction, this night.

2d. Rates of Mean Solar Chronometer No. 141.

1859.		Elapsed Mean Solar interval.	Rate per 24 Mean Solar Hours.
From	To	Days and Decimals.	+ Gaining. — Losing.
			s.
January 18,	January 21,	3.083	+ 0.082
January 21,	January 24,	2.889	— 2.651
January 24,	January 26,	2.002	— 0.500

It will be observed that the rate of mean solar chronometer No. 141, changed materially, between the 21st and 24th of January, from its usual mean rate. This we attribute to the fact that it was kept, during that time, in a room very much over heated by a large iron stove. The weather during this time was very cold out of doors, and, fearing the chronometer might be subject to too cold an atmosphere, during my absence from Toledo on a visit to Cleveland, I cautioned the person in whose care it was left at Toledo, for the purpose of noting by it there the telegraphic signals of the 23d, not to permit the temperature of the room to fall below 70° of Fahrenheit. He over shot the mark, and when I returned from Cleveland on the afternoon of the 24th, on entering the room where the chronometer was, I was surprised to find the temperature so high that it was distressing to remain a moment in the room. It must be remarked, however, that this new rate, during the short period mentioned, combined with the time-observations made at Cleveland on the 23d, and the telegraphic signals which were interchanged between that place and Toledo on that night, give a result for the longitude of Cleveland, which corresponds very nearly (within 0*s*.77 of time) with that which was obtained by the interchange of signals with Chicago on the night of August 5th, 1858.

Both results were derived from observations made under very unfavourable circumstances. If they do not settle the longitude of this place definitely, it is believed that they at least give a close approximation to it, as will presently be shown, when we come to treat of that position.

XXII. ELYRIA, OHIO.

This is the seat of justice of Loraine county, and the nearest lake port is the mouth of Black river of Lake Erie.

Station.—In the court-house public square. This station is 35 feet west of the meridian, and 152 feet north of the parallel of the dome of the court-house.

1*st. The Latitude.* 1859, *January* 19*th.*

	°	′	″
By 16 circum-meridian altitudes of β Orionis, south, combined with 16 altitudes of Polaris, north:			
Latitude of station, - - -	41	22	02.75
Reduction to the dome of the court-house, -			— 1.50
Latitude of the dome of the court-house at Elyria,	41	22	01.25 N.

2*d. Observations for the Time.* 1859, *January* 19*th.*

			h.	m.	s.
Sidereal chronometer No. 2557, fast:					
By 10 observations on β Geminorum, east (at 3*h.* 50*m.*) - - - -			+ 1	00	28.47
By 6 observations on α Andromedæ, west (at 4*h.* 08*m.*) - -	1	00	28.30		
By 9 observations on β Andromedæ, also west (at 4*h.* 45*m.*) - -	1	00	28.33		
By 15 observations on 2 West Stars (at 5*h.* 27*m.*) - - -	1	00	28.32		
			+ 1	00	28.32
Result—Chronometer No. 2557, fast of sidereal time for this station (at 4*h.* 08*m.*)			+ 1	00	28.39

3*d. The Longitude.*

The above result, combined with the time-observations made at Toledo on the nights of the 18th and 21st of January, already given, and the telegraphic signals which were passed between these two places, give the longitude of Elyria, as follows, viz.—

Determination of the difference of Longitude between Toledo, Ohio, and Elyria, Ohio, by electric signals for comparisons of time, January 19*th*, 1859.

Sidereal Chronometer No. 2557, fast, of Elyria sidereal time (at 6*h.* 23*m.* 23.6*s.* sidereal time), 1*h.* 00*m.* 28*s.*93.

Rate per sidereal day, + 5*s.*710; or per sidereal hour, + 0*s.*238.

Mean Solar Chronometer No. 141, slow, of Toledo, mean solar time (at 10*h*. 21*m*. 40*s*.5 mean time), 20*m*. 50*s*.54.

Rate per mean solar day, + 0*s*.082; or per mean solar hour, + 0*s*.0034.

1st.—Toledo signals recorded at both stations.

Times of Signals given at Toledo by mean solar Chronometer No. 141.	Correct Toledo mean solar time of Toledo signals.	Times of Toledo signals as noted at Elyria, by sidereal Chronometer No. 2557.	Elyria correct sidereal time of Toledo signals.	Toledo reduced sidereal time of Toledo signals.	Difference of Longitude by each signal.—Elyria east of the meridian of Toledo.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 00 50	10 21 40.54	7 23 52.5	6 23 23.57	6 17 41.50	0 05 42.07
10 03 50	10 24 40.54	7 26 53	6 26 24.06	6 20 41.99	0 05 42.07
10 06 50	10 27 40.54	7 29 53 5	6 29 24.55	6 23 42.48	0 05 42.07
10 15 40	10 36 30.54	7 38 45	6 38 16.01	6 32 33.93	0 05 42.08
10 18 50	10 39 40.54	7 41 55.5	6 41 16.50	6 35 44.45	0 05 42.05
10 21 40	10 42 30.54	7 44 46	6 44 16.99	6 38 34.92	0 05 42.07
10 33 40	10 54 30.54	7 56 48	6 56 18.94	6 50 36.89	0 05 42.05
10 36 40	10 57 30.54	7 59 48.5	6 59 19.43	6 53 37.38	0 05 42.05

1st Mean.—Electric signals sent from Toledo to Elyria, - 0 05 42.06

2d.—Elyria signals recorded at both stations.

Times of signals given at Elyria by sidereal Chronometer No. 2557.	Times of Elyria signals as noted at Toledo by mean solar Chronometer No. 141.	Toledo correct mean solar time of Elyria signals.	Toledo reduced sidereal time of Elyria signals.	Elyria correct sidereal time of Elyria signals.	Difference of Longitude by each signal.—Elyria east of the meridian of Toledo.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
8 14 45	10 51 34	11 12 24.54	7 08 33.83	7 14 15.87	0 05 42.04
8 17 45.5	10 54 34	11 15 24.54	7 11 34.32	7 17 16.36	0 05 42.04

2d Mean.—Electric signals sent from Elyria to Toledo, - 0 05 42.04

1st Mean.—Electric signals sent from Toledo to Elyria, as above - - - - - - - 0 05 42.06

Result:—Elyria Observing Station east in longitude of Toledo observing Station, by a mean of the two sets of signals, — 0 05 42.05

Longitude of Toledo observing station,—see No. IX., *ante*— - - - - + 5 34 09.57

Result—Longitude of Elyria observing station, west of the meridian of Greenwich, - + 5 28 27.52

Equal, in arc, to - - - - 82° 06′ 52″.8 W.

Latitude of this station, as before given, - 41° 22′ 02″.75 N.

By an azimuth of Polaris, observed with the theodolite and chronometer, this night, and offsets measured next morning, from our station, we get the following positions in Elyria, viz.—

POSITIONS IN ELYRIA, OHIO.	Latitude, North.	Longitude west of Greenwich.	
		In Arc.	In Time.
			h. m. s.
1. Dome of Elyria Court House, -	° ′ ″ 41 22 01.25	° ′ ″ 82 06 52.3	5 28 27.49
2. Steeple of the Presbyterian Ch., built of stone, on Short Street, at the S. W. corner of Second or South Street, - - - - - - -	41 22 01.21	82 06 55.1	5 28 27.67

XXIII. CLEVELAND, OHIO.

Station.—The point of intersection of the middle of Bank street, with the north-western margin of Lake street.

Comparison of Longitude with the Meridian of Chicago.

1858, *August 5th.*

The night was unfavourable for observation. The sky to the south was entirely clouded, so that no star could be observed in that direction for the latitude. The only observations that could be obtained for that purpose, were two altitudes of Polaris, north, which gave, *approximately*, as follows, viz.—

Latitude of station, - - - - 41° 30′ 10″

Observations for the Time.

	m.	s.
By 11 observations on α Andromedæ, east (at 20*h.* 28*m.*) - - - - -	+ 40	08.84
By 3 observations on α Ophiuchi, and 7 observations on α Lyræ, both west (at 21*h.* 29*m.*) - -	+ 40	09.77
Result—Chronometer No. 2557, fast of sidereal time for this station (at 20*h.* 58*m.* 30*s.*) - -	+ 40	09.30

Clouds prevented observations on better time-stars in the west. Both ε Bootis and α Coronæ Borealis were carefully watched for, but in vain; also ζ Herculis, at a later period of the night, but he also was hidden from view.

The great discrepancy between the N. Declination of α Andromedæ, and either α Ophiuchi, or α Lyræ, combined with the fact that the latitude—which becomes a term in the equation for computing the time,—was not closely determined, induces us to doubt if our chrono-

meter error can be depended on to-night, nearer than one second of time. However, as this, even, affords a desirable approximation to the true longitude of Cleveland, we think it may be well to report the result. It depends on the time-observations for this night at Cleveland, above given, those at Chicago given under the dates of August 4th and 12th, 1858, and the following telegraphic signals, viz.—

Determination of the difference of Longitude between Chicago and Cleveland, by electric signals for comparisons of time, August 5th, 1858.

Sidereal Chronometer No. 2557, fast, of Cleveland sidereal time (at $22h.\ 18m.\ 47s.$ sidereal time), $40m.\ 09s.61$.

Rate per sidereal day, $+\ 5s.58$; or per sidereal hour, $+\ 0s.232$.

Mean solar Chronometer No. 141, slow, of Chicago mean solar time (at $12h.\ 57m.$ mean time), $4m.\ 31s.46$.

Rate per mean solar day, $+\ 0s.455$; or per mean solar hour, $+\ 0s.01896$.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Cleveland by sidereal Chronometer No. 2557.	Cleveland correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Cleveland east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
12 52 30	12 57 01.46	22 58 57.5	22 18 47.89	21 55 05.74	0 23 42.15
12 55 40	13 00 11.46	23 02 08	22 21 58.38	21 58 16.26	0 23 42.12
12 58 30	13 03 01.46	23 04 58.5	22 24 48.87	22 01 06.73	0 23 42.14
13 14 00	13 18 31.45	23 20 31	22 40 21.31	22 16 39.27	0 23 42.04
13 17 10	13 21 41.45	23 23 41.5	22 43 31.80	22 19 49.79	0 23 42.01
13 20 10	13 24 41.45	23 26 42	22 46 32.29	22 22 50.28	0 23 42.01
13 23 00	13 27 31.45	23 29 32.5	22 49 22.77	22 25 40.74	0 23 42.03
14 01 54	14 06 25.43	00 08 33	23 28 23.12	23 04 41.11	0 23 42.01
14 10 40	14 15 11.43	00 17 20.5	23 37 10.59	23 13 28.56	0 23 42.03
14 16 40	14 21 11.43	00 23 21.5	23 43 11.56	23 19 29.54	0 23 42.02

1st Mean.—Electric signals sent from Chicago to Cleveland, 0 23 42.056

2d.—Cleveland signals recorded at both stations.

Times of signals given at Cleveland by sidereal Chronometer No. 2557.	Times of Cleveland signals, as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Cleveland signals.	Chicago reduced sidereal time of Cleveland signals.	Cleveland correct sidereal time of Cleveland signals.	Difference of Longitude by each signal.—Cleveland east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
23 59 32	13 52 54.5	13 57 25.93	22 55 40.14	23 19 22.16	0 23 42.02
0 02 32.5	13 55 54.5	14 00 25.93	22 58 40.63	23 22 22.65	0 23 42.02
0 05 32	13 58 53.5	14 03 24.93	23 01 40.12	23 25 22.13	0 23 42.01
0 20 21	14 13 40	14 18 11.43	23 16 29.05	23 40 11.07	0 23 42.02

2d Mean.—Electric signals sent from Cleveland to Chicago, 0 23 42.018

1st Mean.—Electric signals sent from Chicago to Cleveland, as above, - - - - - - - 0 23 42.056

Result:—Cleveland Observing Station is east, in longitude of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - — 0 23 42.037

Longitude of Chicago Station No. 3. - + 5 50 31.20

1st Approximation.

Longitude of Cleveland Station, - - + 5 26 49.16

When the time-signals were being exchanged with Chicago, there was much excitement and some interruption, from noise, in the telegraph offices at both places, arising from the celebrations which were going on in commemoration of the successful laying of the great metallic cable across the Atlantic ocean, which placed the continents of Europe and America, for a short time, in electro-telegraphic communication. The news of this important event was, this day, announced by telegraph all over our country. This accounts for the signals, forth and back, not agreeing quite so close as usual. Here there is an extreme difference of 0*s*.14 of time between the greatest and least telegraphic result. But if we except 3 out of the 14 signals transmitted, the extreme difference in the 11 remaining is only 0*s*.03 of time. So far, therefore, as the signals are concerned, there is probably no appreciable error in the mean adopted.

Comparison of the Longitude with the Meridian of Toledo.

1859, *January 22d.* Arrived at Cleveland, from Toledo, this afternoon. Cloudy all night, and no observations could be made.

January 23d. At the station which was occupied for the observations of August 5th, 1858.

Sidereal chronometer No. 2557, fast of sidereal time:

1st Set.

By 4 pairs of equal altitudes of the sun, observed A. M. and P. M., middle time of observations being apparent noon, or say (20*h*. 22*m*.) sidereal time of the 22d, - - - -		+ 59 09.33
2d Set.		
By 10 observations on β Geminorum, east, (at 28*h*. 26*m*.) - -	59 10.10	
By 2 observations on β Andromedæ, west (at 28*h*. 50*m*.) - -	59 10.51	
By E. and W. Stars, (at 28*h*. 38*m*.)	59 10.30	+ 59 10.30
Result—Chronometer No. 2557, fast of sidereal time for this station, January 23d, 1859 (at 0*h*. 30*m*. sidereal), - - - - -		+ 59 09.81

Here we had, again, an unfavourable night for observation, being so cloudy that only two observations could be obtained west, for the time. The clouds were so dense to the north and south, that no observations whatever could be got for the latitude.

The time derived from the East and West stars, however, agrees well with that obtained from the equal altitudes of the sun, if we take into account the usual rate of the chronometer for the elapsed time between the two sets. This is evidence enough that our approximate latitude, used as a term in the equation for computing the time by the stars, was accurate enough for that object. The time may, therefore, be considered as pretty well determined at Cleveland on this occasion. But the disturbance in the usual rate of mean solar chronometer No. 141, owing to the very high temperature of the room in which it was kept at Toledo, during this journey, must be considered. Although we may suppose that the new rate thus acquired, was probably uniform during our absence from Toledo, yet we cannot be certain that it was so. All things, therefore, being considered, we are inclined to attribute equal weight to the resulting longitude of Cleveland, from this journey, and that which was obtained on the night of August 5th, 1858, by comparison with the meridian of Chicago.

The Longitude.

The result of the time-observations at Cleveland, of January 23d, above given, combined with that obtained for Toledo, from the obser-

vations made there on the nights of the 21st and 24th of January, and the electric signals of the 23d, give us a second *approximate determination* of the longitude of Cleveland, as follows, viz.—

Determination of the difference of Longitude between Toledo and Cleveland, Ohio, by electric signals for comparisons of time, January 23d, 1859.

Sidereal Chronometer No. 2557, fast, of Cleveland sidereal time (at 6*h*. 20*m*. sidereal time), 59*m*. 10*s*.91.

Rate per sidereal day, + 4*s*.515; or per sidereal hour, + 0*s*.188.

Mean solar Chronometer No. 141, slow, of Toledo, mean solar time (at 10*h*. 01*m*. mean time), 20*m*. 55*s*.65.

Rate per mean solar day, — 2*s*.65; or per mean solar hour, — 0*s*.1104.

1st.—Toledo signals recorded at both stations.

Times of signals given at Toledo by mean solar Chronometer No. 141.	Correct Toledo mean solar time of Toledo signals.	Times of Toledo signals, as noted at Cleveland by sidereal Chronometer No. 2557.	Cleveland correct sidereal time of Toledo signals.	Toledo reduced sidereal time of Toledo signals.	Difference of Longitude by each signal.—Cleveland, east of the meridian of Toledo observing station.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
9 40 10	10 01 05.65	7 19 20	6 20 09.09	6 12 49.45	0 07 19.64
9 43 00	10 03 55.65	7 22 10.5	6 22 59.58	6 15 39.94	0 07 19.64
9 45 50	10 06 45.66	7 25 01	6 25 50.07	6 18 30.42	0 07 19.65
10 03 40	10 24 35.69	7 42 54	6 43 43.02	6 36 23.37	0 07 19.65
10 09 40	10 30 35.70	7 48 55	6 49 44.00	6 42 24.35	0 07 19.65
10 12 40	10 33 35.71	7 51 55.5	6 52 44.49	6 45 24.85	0 07 19.64

1st Mean.—Electric signals sent from Toledo to Cleveland, 0 07 19.645

2d.—Cleveland signals recorded at both stations.

Times of signals given at Cleveland by sidereal Chronometer No. 2557.	Times of Cleveland signals as noted at Toledo by mean solar Chronometer No. 141.	Toledo correct mean solar time of Cleveland signals.	Toledo reduced sidereal time of Cleveland signals.	Cleveland correct sidereal time of Cleveland signals.	Difference of Longitude by each signal.—Cleveland east of the meridian of Toledo observing station.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m.* s.
7 31 05	9 51 53	10 12 48.67	6 24 34.40	6 31 54.06	0 07 19.66
7 34 00.5	9 54 48	10 15 43.68	6 27 29.89	6 34 49.55	0 07 19.66
7 37 01	9 57 48	10 18 43.68	6 30 30.38	6 37 50.04	0 09 19.66
7 54 56	10 15 40	10 36 35.71	6 48 25.35	6 55 44.98	0 07 19.63
7 57 54.5	10 18 38	10 39 33.72	6 51 23.84	6 58 43.47	0 07 19.63

2d Mean.—Electric signals sent from Cleveland to Toledo, 0 07 19.648

1st Mean.—Electric signals sent from Toledo to Cleveland, as above, - - - - - - - - 0 07 19.645

Result:—Cleveland Station is east, in longitude, of Toledo observing station, by a mean of the two sets of signals, — 0 07 19.64

	h.	m.	s.
Brought forward	— 0	07	19.64
Longitude of Toledo Station, - -	+ 5	34	09.57

2d Approximation.

Longitude of Cleveland Station, by the observations of January, 1859, - - -	+ 5	26	49.93

1st Approximation.

Longitude of same station by the observations of August, 1858, as before given, -	+ 5	26	49.16

Approximate Result adopted—Longitude of the intersection of the middle of Bank street with the north-western margin of Lake street, Cleveland, Ohio, west of the meridian of Greenwich, -	5	26	49.54
Equal, in arc, to - - - -	81°	42′	23″.1 W.
Approximate latitude of the same station, as before given, - - - - -	41°	30′	10″ N.

We think the position above given may be relied on as within 1*s.* of time for the longitude, and within 15 seconds of arc for the latitude; an approximation which may be useful to geographers.

According to this approximation, the new Court House at Cleveland is in about:

Latitude - - - -	41° 30′ 05″ N.
Longitude, from Greenwich, - -	81° 42′ 06″.1 W.
Equal, in time, to - - -	5*h.* 26*m.* 48.4*s.*

XXIV. COLUMBUS, THE CAPITAL OF OHIO.

Station.—From this station, to a point perpendicularly under the centre of the dome of the State Capital, is S. 10° E. (true) 277 feet, horizontal measurement. Hence, the reduction from our station to the centre of the said dome is, in latitude, — 2″.7, and in longitude — 0″.62 in arc, = — 0*s.*04 in time.

1859, *January 25th.* The night was hazy; but as any errors from the atmospheric refraction, that might arise from this circumstance, are eliminated by the system of observing on north and south stars for the latitude, and on east and west stars for the time, the results obtained to-night, both for the latitude and longitude, are considered satisfactory.

1st. The Latitude.

By 11 circum-meridian altitudes of β Orionis, south, combined with 15 altitudes of Polaris, north: latitude of station, - - - 39° 57′ 45″.9 N.

Reduction to the dome of the State Capitol, — 2″.7

Result—Latitude of the dome of the State Capitol at Columbus, Ohio, - - - 39° 57′ 43″.2 N.

2d. Observations for the Time.

Sidereal chronometer No. 2557, fast:

1st Set. Before the signals.

	h.	*m.*	*s.*
By 7 observations on β Geminorum, east (at 4*h*. 49*m*.) - -	1	04	31.96
By 8 observations on β Tauri, west (at 8*h*. 51*m*.) - - -	1	04	32.58
1st Result. Before the signals— Chronometer fast (at 6*h*. 50*m*.)	1	04	32.27

h. *m*. *s*.
+ 1 04 32.27

2d Set. After the signals.

By 6 observations on α Tauri, west (at 8*h*. 32*m*.) - -	1	04	32.63
By 4 observations on β Leonis, east (at 9*h*. 04*m*.) - -	1	04	32.32
2d Result. After the signals— Chronometer fast (at 8*h*. 48*m*.)	1	04	32.47

+ 1 04 32.47

Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 7*h*. 49*m*. sidereal), + 1 04 32.37

The number of observations in each set would have been greater, but that the stars were frequently obscured by a mist that was passing.

3d. The Longitude.

The above result for the Columbus time, and the results for the Toledo time, from the observations of the 24th and 26th inst., combined with the following electric signals, give us the longitude of the State Capital at Columbus, as follows, viz.—

Determination of the difference of Longitude between Toledo and Columbus, Ohio, by electric signals for comparisons of time, January 25th, 1859.

Sidereal Chronometer No. 2557, fast, of Columbus sidereal time (at 7*h*. 09*m*. 52*s*. sidereal time), 1*h*. 04*m*. 32*s*.25.

Rate per sidereal day, + 4*s*.473; or per sidereal hour, + 0*s*.1864.

Mean Solar Chronometer No. 141, slow, of Toledo mean solar time (at 10*h*. 47*m*. 58*s*. mean time), 20*m*. 58*s*.61.

Rate per mean solar day, — 0*s*.500; or per mean solar hour, — 0*s*.0208.

1st.—Toledo signals recorded at both stations.

Times of signals given at Toledo by mean solar Chronometer No. 141.	Correct Toledo mean solar time of Toledo signals.	Times of Toledo signals as noted at Columbus by sidereal Chronometer No. 2557.	Columbus correct sidereal time of Toledo signals.	Toledo reduced sidereal time of Toledo signals.	Difference of Longitude by each signal.—Columbus east of the meridian of Toledo.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 27 00	10 47 58.61	8 14 24.5	7 09 52.25	7 07 43.23	0 02 09.02
10 30 00	10 50 58.61	8 17 25	7 12 52.74	7 10 43.72	0 0 09.02
10 33 00	10 53 58.61	8 20 25.5	7 15 53.23	7 13 44.21	0 02 09.02

1st Mean.—Electric signals sent from Toledo to Columbus, Ohio, 0 02 09.02

2d.—Columbus signals recorded at both stations.

Times of signals given at Columbus by sidereal Chronometer No. 2557.	Times of Columbus signals, as noted at Toledo by mean solar Chronometer No. 141.	Toledo correct mean solar time of Columbus signals.	Toledo reduced sidereal time of Columbus signals.	Columbus correct sidereal time of Columbus signals.	Difference of Longitude by each signal.—Columbus east of the meridian of Toledo.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
8 23 24	10 35 58	10 56 56.61	7 18 51.72	7 16 42·70	0 02 09.02
8 26 26.5	10 39 00	10 59 58.62	7 21 54.21	7 19 45.20	0 02 09.01
8 29 27	10 42 00	11 02 58.62	7 21 54.70	7 22 45.70	0 02 09.00
8 32 27.5	10 45 00	11 05 58.62	7 27 55.20	7 25 46.19	0 02 09.01
8 35 28	10 48 00	11 08 58.62	7 30 55.69	7 28 46.68	0 02 09.01
8 38 28.5	10 51 00	11 11 58.63	7 33 56.19	7 31 47.18	0 02 09.01

2d Mean.—Electric signals sent from Columbus to Toledo, 0 02 09.01

1st Mean.—Electric signals sent from Toledo to Columbus, as above, - - - - - - - 0 02 09.02

Result:—Columbus Observing Station, east in longitude, of Toledo observing Station, by a mean of the two sets of signals, - - - - - - — 0 02 09.015

	h.	m.	s.
Brought forward,	— 0	02	09.01
Reduction to the dome of the State Capital,		— 0	04
Dome of the State Capitol is east, in longitude, of Toledo station,	— 0	02	09.05
Longitude of Toledo observing station,	+ 5	34	09.57
Result—Longitude of the dome of the State Capital at Columbus, Ohio, west of the meridian of Greenwich,	5	32	00.52
Equal, in arc, to	83°	00′	07″.8
Latitude of this dome, as before given,	39°	57′	43″.2 N.

Verification of the Positions of Michigan City, Indiana, and Madison, Wisconsin.

The approximate positions of these stations were given in our previous paper, printed in Vol. VI. of the Society's Proceedings; the first numbered as Station II., and the other as Station VI. See pp. 363 to 365, and 385 to 388 of that volume.

We have since had opportunities for testing the results, then reported, by more reliable observations, which we will now give.

II. MICHIGAN CITY, INDIANA.

Station.—The centre of the public square, bounded on the north by Michigan street, on the south by Fourth, on the east by Franklin, and on the west by Washington street.

By a survey made with the theodolite and chain,—the true azimuths of the courses being determined from four azimuths of Polaris, 2 by direct observation, and 2 others by reflection from the horizon of quicksilver, on the 17th May, 1859, with the times by the sidereal chronometer,—we find that this new station is S. 11° 15′ 49″ E., (true) and distant 1717 feet from our station of June 21st, 1858. Hence the reduction from the station of 1858 to that of 1859, at the centre of the aforesaid public square is, in latitude, — 16″.64, and in longitude — 4″.41 in arc, = 0*s*.294 in time.

From the centre of the public square, to the station where Captain Andrew Talcott observed in 1833, as pointed out to us by Herman Lawson, Esq., attorney at law, who was here at that time and still resides here, is N. 12° 05′ 25″ W., (true) and the measured distance

is 227 feet. Hence the reduction from our new station at the centre of the public square to Talcott's station is, in latitude, + 2″.19, and in longitude + 0″.63 in arc, = 0*s*.04 in time.

The positions of other points in relation to our observing stations, were also fixed by our survey, and will be given hererfter.

It will be remembered that the position of our station of June 21st, 1858, was stated, in our former paper, to be *approximately*, as follows, viz. (See Vol. VI. page 363.)

Latitude, - - - -	41° 43′ 25″ N.
Longitude, west of Greenwich, -	5*h*. 47*m*. 37*s*.41

This was the result of a few observations made within the space of one hour and forty minutes, on that night, and a series of telegraphic signals for comparing the longitude with the meridian of Chicago.

A reduction of the above determination, to our station of 1859, gives the position of the centre of the public square, as follows, viz.—

Determination 1st, of June 21st, 1858.

Latitude, - - - -	41° 43′ 08″.26
Longitude, west from Greenwich, -	5*h*. 47*m*. 37*s*.12

We will now give the observations made in 1859, and the results, as follows, viz.—

At the centre of the Public Square in Michigan City, Indiana.

1*st*. *The Latitude.*

	°	′	″
1859, *May* 17*th*. By 14 circum-meridian altitudes of α Virginis, south, combined with 17 altitudes of Polaris, north: latitude of station, - -	41	43	08.3
1858, *June* 21*st*. By 10 circum-meridian altitudes of β Libræ, south, combined with 5 altitudes of Polaris, north, reduced from the old, to this station, as already shown, - - - -	41	43	08.36
Result adopted—Latitude of the centre of the Michigan City Public Square, - - -	41	43	08.33

2*d*. *Observations for the Time.* 1859, *April* 28*th*.

	h.	*m*.	*s*.
Sidereal chronometer No. 2557, fast:			
By 10 observations on ε Bootis, east (at 12*h*. 11*m*.) - - -	1	31	05.20
By 10 observations on α Coronæ Borealis, also east (at 11*h*. 44*m*.) -	1	31	05.33

		h. m. s.
By 20 observations on 2 West Stars, (at 11*h*. 28*m*.) - -	1 31 05.26	
		+ 1 31 05.26
By 10 observations on β Geminorum, west (at 11*h*. 30*m*.) - - - -		+ 1 31 05.29
Result—Chronometer No. 2557, fast of sidereal time for this station (at 11*h*. 29*m*.) - -		+ 1 31 05.27

The above result for the Michigan City time, combined with the observations made on the 27th and 29th of April, for the time at Chicago, and the following telegraphic signals, give us a second determination of the longitude of Michican City, viz.—

Determination of the Difference of Longitude between Chicago and Michigan City, Indiana, by electric signals for comparisons of time, April 28th, 1859.

Sidereal Chronometer No. 2557, fast, of Michigan City sidereal time (at 12*h*. 47*m*. 47*s*. sidereal time), 1*h*. 31*m*. 05*s*.63.

Rate per sidereal day, + 6*s*.669; or per sidereal hour, + 0*s*.2775.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 10*h*. 18*m*. 32*s*. mean time), 4*m*. 41*s*.32.

Rate per mean solar day, — 0*s*.17; or per mean solar hour, — 0*s*.007.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Michigan City by sidereal Chronometer No. 2557.	Michigan City correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Michigan City east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 13 50	10 18 31.32	14 18 52.5	12 47 46.87	12 44 53.37	0 02 53.50
10 16 50	10 21 31.32	14 21 53	12 50 47.35	12 47 53.86	0 02 53.49
10 28 40	10 33 21.32	14 33 45	13 02 39.30	12 59 45.80	0 02 53.50
10 37 40	10 42 21.32	14 42 46.5	13 11 40.76	13 08 47.28	0 02 53.48

1st Mean.—Electric signals sent from Chicago to Michigan City, 0 02 53.49

2d.—Michigan City signals recorded at both stations.

Times of signals given at Michigan City by sidereal Chronometer No. 2557.	Times of Michigan City signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago coreect mean solar time of Michigan City signals.	Chicago reduced sidereal time of Michigan City signals.	Michigan City correct sidereal time of Michigan City signals.	Difference of Longitude by each signal.—Michigan City east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
14 27 44	10 22 40	10 27 21.32	12 53 44.82	12 56 38.32	0 02 53.50
14 30 44.5	10 25 40	10 30 21.32	12 56 45.31	12 59 38.81	0 02 53.50
14 36 45.5	10 31 40	10 36 21.32	13 02 46.30	13 05 39.79	0 02 53.49
14 39 46	10 34 40	10 39 21.32	13 05 46.79	13 08 40.27	0 02 53.48

2d Mean.—Electric signals sent from Michigan City to Chicago, 0 02 53.49

1st Mean.—Electric signals sent from Chicago to Michigan City, as above, - - - - - - - 0 02 53.49

Result:—Centre of public square in Michigan City, east in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - — 0 02 53.49

Longitude of Chicago Station No. 3, - + 5 50 31.20

Determination 2d.

Longitude of the centre of Public Square at Michigan City, - - - - - 5 47 37.71

I was obliged, on the 17th of May, 1859, to go again to Michigan City, on public duty, and this visit enabled me to obtain a third result for the longitude of this place, as follows, viz.—

1859, *May*, 27*th*. *At the same Station.*

Sidereal chronometer No. 2557, fast:

	h. m. s.	*h. m. s.*
By 13 observations on β Geminorum, west (at 11*h*. 43*m*.) - -	1 33 29.30	
By 9 observations on ε Leonis, also west (at 13*h*. 01*m*.) - -	1 33 29.23	
By 22 observations on 2 West Stars, (at 12*h*. 22*m*.) - -	1 33 29.26	+ 1 33 29.26
By 13 observations on α Coronæ Borealis, east (at 12*h*. 02*m*.) - - - -		+ 1 33 29.30
Result—Chronometer No. 2557, fast of sidereal time for this station (at 12*h*. 12*m*.) -		+ 1 33 29.28

This result, and the results of the time-observations made at Chicago on the 16th and 19th* of May, and the following telegraphic signals, give us a third determination of the longitude of Michigan City, as follows, viz.—

Determination of the difference of Longitude between Chicago and Michigan City, by electric signals for comparisons of time, May 17th, 1859.

Sidereal Chronometer No. 2557, fast, of Michigan City sidereal time (at 14*h*. 11*m*. 12*s*. sidereal time), 1*h*. 33*m*. 29*s*.89.

Rate per sidereal day, — 7*s*.366; or per sidereal hour, — 0*s*.307.

Mean solar Chronometer No. 141, slow, of Chicago, mean solar time (at 10*h*. 27*m*. mean time), 4*m*. 41*s*.02.

Rate per mean solar day, + 0*s*.377; or per mean solar hour, + 0*s*.0157.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago, by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Michigan City by sidereal Chronometer No. 2557.	Michigan City correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Michigan City east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
10 22 20	10 27 01.02	15 44 42.5	14 11 12.61	14 08 19.03	0 02 53.58
10 25 20	10 30 01.02	15 47 43	14 14 13.10	14 11 19.52	0 02 53.58
10 28 20	10 33 01.02	15 50 43.5	14 17 13.58	14 14 20.01	0 02 53.57

1st Mean.—Electric signals sent from Chicago to Michigan City, 0 02 53.577

2d.—Michigan City signals recorded at both stations.

Times of signals given at Michigan City by sidereal Chronometer No. 2557.	Times of Michigan City signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Michigan City signals.	Chicago reduced sidereal time of Michigan City signals.	Michigan City correct sidereal time of Michigan City signals.	Difference of Longitude by each signal.—Michigan City east of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
15 56 44.5	10 34 20	10 39 01.01	14 20 20.99	14 23 14.55	0 02 53.56
15 59 45	10 37 20	10 42 01.01	14 23 21.48	14 26 15.03	0 02 53.55
16 02 45.5	10 40 20	10 45 01.01	14 26 21.98	14 29 15.52	0 02 53.54

2d Mean.—Electric signals sent from Michigan City to Chicago, 0 02 53.55

1st Mean.—Electric signals sent from Chicago to Michigan City, as above, - - - - - - - 0 02 53.577

Result:—Centre of Public Square in Michigan City is east, in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - — 0 02 53.56

* It was cloudy at Chicago, May 18th, and no observations could be made on that night.

	h.	m.	s.
Brought forward,	— 0	02	53.56
Add longitude of Chicago station No. 3, -	+ 5	50	31.20

3d Determination.

Longitude of the centre of the public square of Michigan City, - - - - -	5	47	37.64

We have here three determinations of the longitude of this position: one from observations in June, 1858, and two from observations in 1859, namely, April 28th and May 17th. The time-stars were much better selected in 1859 than in 1858, which will appear on a comparison of their north declinations. Those in 1859, were all observed near the prime vertical, but those of 1858 were observed before reaching the prime vertical, east or west, and on different sides of it, though at nearly equal altitudes. All things considered, we think the two results of 1859 are each entitled to twice the weight of that of 1858. On this principle the final result is presented, as follows, viz.—

SUMMARY.—*Longitude of the Centre of this Public Square:*

	h.	m.	s.
By determination 1st, of June 21st, 1858, -	5	47	37.12
By determination 2d, of April 28th, 1859, -	5	47	37.71
By determination 3d, of May 17th, 1859, - -	5	47	37.64

Result adopted, giving the 2d and 3d determinations each a double weight.

Longitude of the centre of the public square at Michigan City, Indiana, west of the meridian of Greenwich, - - - - -	5	47	37.56
Equal, in arc, to - - -	86°	54′	23″.4 W.
Latitude of the same point, as before given,	41°	43′	08″.33 N.

From our survey, based on the above result, and observed azimuths of Polaris for determining the true courses, we obtain the positions of other points in Michigan City. The following table shows them all:

POSITIONS IN MICHIGAN CITY, INDIANA.	Latitude North.	Longitude West of Greenwich.	
		In Arc.	In Time.
	° ′ ″	° ′ ″	h. m. s.
1. Centre of the Public Square, -	41 43 08.33	86 54 23.4	5 47 37.56
2. Intersection of the middle of Franklin with the middle of Michigan Street, - - - - -	41 43 11.23	86 54 21.4	5 47 37.43
3. Passenger house of the Michigan Central Rail Road Company's Station, - - - - - -	41 43 18.91	86 54 26.79	5 47 37.78
4. The Light House, - - - - -	41 43 22.88	86 54 32.60	5 47 38.17
5. Mouth of Trail Creek, (east cape of), - - - - - - - -	41 43 24.58	86 54 37.23	5 47 38.48
6. The Episcopal Church on Pine St. between Market and Fourth Streets, - - - - - - - -	41 43 07	86 54 13.28	5 47 36.88

In Talcott's map, accompanying his report on the survey of the Michigan and Ohio boundary of 1833, he lays down the position of Michigan City in latitude 41° 43′ 10″.8 N., and in longitude 86° 43′ 26″.9 = 5*h*. 46*m*. 53*s*.8 W. By our observations, his station, here, appears to be in latitude 41° 43′ 10″.52 N., and in longitude 86° 54′ 24″ = 5*h*. 47*m*. 37*s*.6 W. While there is a remarkable agreement in our observations of the latitude, we place the longitude 43*s*.76 of time, = 10′ 56″.4 in arc, = 9.42 miles, west of the position assigned to it on Talcott's map.

Captain Talcott, in his report, gives the longitude of the south bend of Lake Michigan, - -	° ′ ″ 87 09 06	h. m. s. = 5 48 36.4
By applying our difference of longitude, found at Michigan City, viz:	+ 10′ 56″.4	= + 43*s*.76
We assume, for the approximate longitude of the south bend of Lake Michigan, until we can have an opportunity of connecting it by observation with our primary meridian of Chicago, - -	° ′ ″ 87 20 02.4	h. m. s. = 5 49 20.16
The latitude of this bend, is no doubt very accurately stated by Talcott, at . - - - -		° ′ ″ 41 37 07.9 N.

VI. MADISON, THE CAPITAL OF WISCONSIN.

In our former paper, we gave an approximation to the geographical position of this place, derived from unsatisfactory observations made during unfavourable weather, which cut us off from a selection of pairs of stars well matched in declination for eliminating errors of observation, either for the determination of the latitude or the longitude.

The approximate result then arrived at appears, from more accurate observations recently made, to have given the latitude too great by about 9″.5, and the longitude too little by about 1*s*.2 of time. This, however, was far more accurate than the position assigned to Madison on any of the maps extant.

These more recent observations are now presented, as follows, viz:

1*st. The Latitude.* 1859, *June 4th. At Madison Station No.* 2.*

	° ′ ″
1. By 21 circum-meridian altitudes of α Virginis, south, combined with 17 altitudes of Polaris, north: latitude of station, - - - -	43 04 25
2. *Same night*—By 21 circum-meridian altitudes of β Libræ, south, combined with 17 other altitudes of Polaris, north, observed at a later hour of the night than the 1st set, - - -	43 04 25.24
Result adopted—Latitude of Madison station No. 2,	43 04 25.12 N.
Reduction to the dome of the State Capitol,	+ 5.68
Latitude of the dome of the State Capitol, -	43 04 30.8 N.

Here the stars are well paired with regard to their altitudes when observed, north and south, and the above result is, therefore, believed to be a pretty close approximation to the true latitude of this place.

2d. Observations for the Time. Same night (June 4th, 1859), and same station.

Sidereal chronometer No. 2557, fast:

	1*st Set.* *h. m. s.*
By 10 observations on α Canum Venaticorum, west (at 16*h*. 43*m*.)	1 45 42.17
By 10 observations on α Cygni, east (at 17*h*. 00*m*.) - -	1 45 43.15

* This station and its position relatively with that of the dome of the State Capitol, will be found described in Vol. VI., at page 386 of the Society's Proceedings.

	h. m. s.	h. m. s.
1*st Result*—Chronometer fast (at 16*h.* 52*m.*) - - -	1 45 42.66	+ 1 45 42.66
2d Set.		
By 7 observations on ζ Hercules, and 11 observations on ζ Cygni, both east (at 16*h.* 04*m.*) - -	1 45 42.74	
By 9 observations on ε Bootis, west (at 17*h.* 25*m.*) - -	1 45 42.50	
2*d Result*—Chronometer fast (at 16*h.* 45*m.*) - - -	1 45 42.62	+ 1 45 42.62
Result adopted—Chronometer No. 2557, fast of sidereal time for this station (at 16*h.* 48*m.*)		+ 1 45 42.64

The above result for the Madison time, and the results of the observations for the time at Chicago on the 3d and 6th of June, 1859, already given in their proper places, combined with the following telegraphic signals, give us a new result for the longitude of Madison, as follows, viz.—

Determination of the difference of Longitude between Chicago and Madison, Wisconsin, by electric signals for comparisons of time, June 4th, 1859.

Sidereal Chronometer No. 2557, fast, of Madison sidereal time (at 15*h.* 57*m.* 45*s.* sidereal time), 1*h.* 45*m.* 42*s.*43.

Rate per sidereal day, + 6*s.*086; or per sidereal hour, + 0*s.*2535.

Mean solar Chronometer No. 141, slow, of Chicago mean solar time (at 11*h.* 12*m.* 24*s.* mean time), 4*m.* 44*s.*42.

Rate per mean solar day, — 0*s.*20; or per mean solar hour, — 0*s.*0083.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Madison by sidereal Chronometer No. 2557.	Madison correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Madison is west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
11 07 40	11 12 24.42	17 43 28	15 57 45.57	16 04 47.93	0 07 02.36
11 10 40	11 15 24.42	17 46 28.5	16 00 46.06	16 07 48.42	0 07 02.36
11 25 40	11 30 24.42	18 01 31	16 15 48.49	16 22 50.88	0 07 02.39
1st Mean.—Electric signals sent from Chicago to Madison,					0 07 02.37

2d.—Madison signals recorded at both stations.

Times of signals given at Madison by sidereal Chronometer No. 2557.	Times of Madison signals, as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Madison signals.	Chicago reduced sidereal time of Madison signals.	Madison correct sidereal time of Madison signals.	Difference of Longitude by each signal.—Madison west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
17 52 29.5	11 16 40	11 21 24.42	16 13 49.41	16 06 47.03	0 07 02.38
17 55 30	11 19 40	11 24 24.42	16 16 49.90	16 09 47.52	0 07 02.38
17 58 30.5	11 22 40	11 27 24.42	16 19 50.39	16 12 48.01	0 07 02.38

2d Mean.—Electric signals sent from Madison to Chicago, - 0 07 02.38

1st Mean.—Electric signals sent from Chicago to Madison, as above, - - - - - - - 0 07 02.37

Result:—Madison Observing Station is west, in longitude, of Chicago observing Station No. 3, by a mean of the two sets of signals, - - - - - - + 0 07 02.375

Reduction to the dome of the State Capital, - — 0.23

Dome of the State Capital at Madison, west, in longitude, of Chicago Station No. 3, - + 0 07 02.14

Longitude of Chicago Station No. 3. - + 5 50 31.20

1st Determination.

Longitude of the dome of the State Capital at Madison, + 5 57 33.34

We also observed for the time at Madison, about midnight of June 5th, 1859, and afterwards exchanged telegraphic signals with Chicago, which gave us another comparison with the meridian of Chicago for the longitude of this station, as follows, viz.—

Observations for the Time. At Madison Station No. 2.
1859, *June 5th.*

Sidereal chronometer No. 2557, fast:

By 7 observations on α Canum Venaticorum, west (at 16*h.* 38*m.*) - - - + 1 45 46.99

By 7 observations on α Cygni, east (at 16*h.* 56*m.*) + 1 45 47.48

Result—Chronometer No. 2557, fast of sidereal time for this station (at 16*h.* 47*m.* - - - + 1 45 47.23

A comparison of this result with the last mentioned Chicago time-observations, by means of the following signals, which were exchanged

by telegraph after midnight of June 5th, give us another comparison of longitude between the two places, as follows, viz.—

Determination of the difference of Longitude between Chicago and Madison, Wisconsin, by electric signals for comparisons of time, June 5th, 1859.

Sidereal Chronometer No. 2557, fast, of Madison sidereal time (at 17*h*. 21*m*. 26*s*. sidereal time), 1*h*. 45*m*. 47*s*.37.

Rate per sidereal day, + 6*s*.086; or per sidereal hour, + 0*s*.2535.

Mean solar Chronometer No. 141, slow, of Chicago mean solar time (at 12*h*. 31*m*. 55*s*. mean time), 4*m*. 43*s*.63

Rate per mean solar day, — 0*s*.20; or per mean solar hour, — 0*s*.0083.

1st.—Chicago signals recorded at both stations.

Times of signals given at Chicago by mean solar Chronometer No. 141.	Correct Chicago mean solar time of Chicago signals.	Times of Chicago signals, as noted at Madison by sidereal Chronometer No. 2557.	Madison correct sidereal time of Chicago signals.	Chicago reduced sidereal time of Chicago signals.	Difference of Longitude by each signal.—Madison is west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
12 27 10	12 31 54.64	19 07 13.5	17 21 26.13	17 28 27.76	0 07 01.63
12 30 10	12 34 54.64	19 10 14	17 24 26.61	17 31 28.25	0 07 01.64
12 45 10	12 49 54.64	19 25 16.5	17 39 29.06	17 46 30.72	0 07 01.67
1st Mean.—Electric signals sent from Chicago to Madison,					0 07 01.647

2d.—Madison signals recorded at both stations.

Times of signals given at Madison by sidereal Chronometer No. 2557.	Times of Madison signals as noted at Chicago by mean solar Chronometer No. 141.	Chicago correct mean solar time of Madison signals.	Chicago reduced sidereal time of Madison signals.	Madison correct sidereal time of Madison signals.	Difference of Longitude by each signal.—Madison is west of the meridian of Chicago observing station No. 3.
h. m. s.	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*	*h. m. s.*
19 16 15	12 36 10	12 40 54.64	17 37 29.25	17 30 27.60	0 07 01.65
19 19 15.5	12 39 10	12 43 54.64	17 40 29.74	17 33 28.08	0 07 01.66
19 22 16	12 42 10	12 46 54.64	17 43 30.23	17 36 28.57	0 07 01.66
2d Mean.—Electric signals sent from Madison to Chicago,					0 07 01.657
1st Mean.—Electric signals sent from Chicago to Madison, as above, - - - - - - - -					0 07 01.647
Result:—Madison Observing Station is west, in longitude, of Chicago observing station No. 3, by a mean of the two sets of signals, - - - - - - -					—0 07 01.65

	h.	m.	s.
Brought forward,	+ 0	07	01.65
Reduction to the dome of the Capital, - -		—	0-23
Dome of the Capital, west, in longitude, of Chicago Station No. 3, - - -	+ 0	07	01.42
Longitude of Chicago Station No. 3, -	+ 5	50	31.20

2d Determination of June 5th, 1859.

Longitude of this dome, - - - - -	5	57	32.62
1st Determination, June 4th, 1859, as before given,	5	57	33.34
Result adopted, giving the determination of June 4th a weight of 3, to 2 assigned to that of June 5th, 1859: longitude of the dome of the State Capitol of Wisconsin, at Madison, west of the meridian of Greenwich, - - -	5	57	33.05
Equal, in arc, to - - - -	89°	23′	15″.75 W.
Latitude, as before given, - - -	43°	04′	30″.8 N.

We offer the above as a closer approximation, to supersede that heretofore reported, as derived from the less satisfactory observations of June, 1858.

J. D. GRAHAM,
Member of the Society.

Pending nomination No. 391 was read, and, the balloting being ordered, a letter from Dr. Dunglison was read, regretting his necessary absence.

The resignation of Mr. Hazlehurst was then, on motion of Dr. Hays, accepted.

No further business being before the meeting, the ballot was scrutinised, and Prof. Samuel H. Dickson, M.D., of Philadelphia, was declared duly elected a member of the Society, which was then adjourned.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. VII. JULY—DECEMBER, 1859. No. 62.

Stated Meeting, August 19, 1859.

Present, three members.

Dr. JOHN L. LE CONTE, Secretary, in the Chair.

A letter was read from Prof. Dickson, dated at Phila. Aug. 5, 1859, acknowledging the receipt of notice of his election.

The following donations for the Library were announced:—

Patent Office Report for 1857. Wash. 1858.—*From the U. S. G.*
U. S. Coast S. Report for 1857. Wash. 1858.—*Supt. U. S. C. S.*
Washington Observatory during 1849, 1850.—*From M. F. Maury.*
Astronomical Journal. No. 126. Cambridge.—*From B. A. Gould.*
Monthly Notices, R. A. Soc. XIX. 8. London.—*From the Soc.*
Proceedings Acad. Nat. Sci. 13. Philadelphia.—*From the Society.*
Journ. Franklin Institute. Aug. 1859. Phila.—*From the Institute.*
Med. News and Library. Aug. 1859. Phila.—*Blanchard & Lea.*
Index Catalogue, Public Library of Boston.—*From Prof. Jewett.*
Supplement, By-laws, 6th Report, &c. of the same.—*Prof. Jewett.*
An. Report N. Y. State Library. Albany, 1859.—*The Trustees.*
11th An. Report, Maryland Inst. Baltimore, 1859.—*From the Ins.*
Sitzungsberichte K. A. Math.-Nat. C. XXIV. B. III. H. No. 5—6, 7, 8, 9, 10. XXVIII B, No. 1—26. Phil.-Hist. C. XXIII. B. V. H. No. 5—10, 1—3. Almanach 8th year, 1858, and Festrede by Karajan.—*From the Academy of Sciences at Vienna.*

A communication for the Transactions, was received from Prof. Loomis, entitled OBSERVATIONS OF THE MAGNETIC DIP IN THE UNITED STATES, by Elias Loomis, Professor of Math-

ematics and Natural Philosophy in the University of the City of New York, and referred to a committee consisting of Prof. Kendall, Dr Bridges and Mr. Lesley.

Pending nomination No. 392 was read, and the Society was adjourned.

Stated Meeting, September 16, 1859.

Present, twelve members.

Prof. CRESSON, Vice-President, in the Chair.

A letter was read from the American Oriental Society, dated New Haven, July, 1859, announcing the transmission of a donation to the Library, and requesting exchanges.

A letter was read from M. F. Maury, dated Washington, Sep. 2, 1859, inclosing a communication from Com. Wüllerstorf, just returned from a scientific voyage of circumnavigation in the Austrian Frigate Novara, entitled, *Essay upon the determination of the form of the earth by means of simultaneous observations with the barometer and aneroid.*

A letter was read from G. A. Matile dated Phila. Aug. 27, in relation to the publications of the Roy. Acad. at Brussels.

The following donations for the Library were announced:—

Amer. Journal No. 83, September. N. Haven.—*From the Editors.*
Frank. Inst. Journal. No. 405. Sept. Phila.—*From the Institute.*
Med. News and Library. No. 201. Sept. Phila.—*From the Eds.*
African Repos. XXXV. No. 8. Aug. Wash.—*Amer. Col. Soc.*
Astronomical Notices, No. 7, 8. Albany.—*From the Editors.*
Proc. Boston N. H. Soc. VII. 5, 6, Boston.—*From the Society.*
Proceedings Acad. Nat. Sci. 14. Philadelphia.—*From the Acad.*
Proc. N. Jersey Hist. Soc. VIII. 4. Newark.—*From the Society.*
Journal Amer. Oriental Society from the beginning.—*From the Soc.*
Journ. Elliot S. N. H. Vol. 1. 1, 2. Charleston.—*From the Soc.*
N. Y. Mercan. Lib. As. 38th An. Rep. 1858–9.—*From the Asso.*
La Bourgogne, revue Œnologique, 1 liv. Dijon.—*C. Ladrey, Ed.*
Die principien der heutigen physik. Oration by Dr. Andreas, R. von Ettinghausen. Oct. 29, 1857. Wien.—*I. R. Academy.*
Inquiries concerning a charge of interception in No. 124 of Gould's Astronomical Journal, by John Patterson. Albany.

The committee to which was referred the paper of Prof. Loomis, reported in favour of its publication in the Transactions, which was ordered accordingly, and the committee discharged.

The decease of Richard Rush, a member of this Society, (elected Jan. 17, 1817), was announced by Dr. Bache, as having occurred in July last. On motion of Judge Sharswood, it was ordered that Mr. C. F. Ingersoll be requested to prepare an obituary notice of the deceased.

The paper of Com. Wüllerstorf was referred to a Committee consisting of Prof. Kendall, Prof. F. Rogers and Prof. Cresson.

Prof. Cresson made an oral communication on the auroræ boreales, which occurred on the evenings of Aug. 28th and Sept. 1st, and described minutely their various changes of appearance. Remarks were made by Prof. Trego, Dr. Emerson, Dr. Coates and Prof. Lesley.

Pending nomination No. 392, and new nomination No. 393, were read, and the Society was adjourned.

Stated Meeting, October 7, 1859.

Present, fifteen members.

Prof. Cresson, Vice-President, in the Chair.

Letters were read from E. Uricoechea, President of the New Grenada Society of Naturalists, dated Bogota, 10—8, 1859, desiring the publications of this Society;—from Capt. Wilkes, U. S. N. dated Washington, Sept. 29, announcing the transmission of a donation for the library:—from the Conn. Hist. Soc. dated Hartford, acknowledging the receipt of No. 61 of the Proceedings;—and from Col. Graham dated Chicago, Sep. 20, enclosing the following addition to his contributions No. 3.

VII. ASHTABULA, OHIO.

Station.—The centre of the North Public Square, bounded on the north by a lane thirty feet wide, on the south by Division street, on the east by Main street, and on the west by Park street.

VIII. ERIE, PENNSYLVANIA.

At the end of this article, and immediately preceding the closing

paragraph which begins with the words "my duties required me to return to Chicago," &c., insert the following, viz:

From the above determination of the position of our observing station, and measurements therefrom of the azimuths and distances to other points as laid down on a "Map of the Borough of Erie, with the water lots and harbour, made by order of the Burgess and Town Council of the Borough of Erie, in 1837, under the supervision of T. S. Brown, Civil Engineer," we obtain the latitudes and longitudes of said positions within the City and harbour of Erie, as follows, viz:

POSITIONS IN THE CITY AND HARBOUR OF ERIE, PENNSYLVANIA.	North Latitude.	Longitude West of the Meridian of Greenwich.	
		In Arc.	In Time.
1. Centre of the Public Park, or intersection of the axes of State street and Sixth street, produced,	° ′ ″ 42 07 51.5	° ′ ″ 80 05 35.3	*h. m. s.* 5 20 22.35
2. Steeple of the Court House, north side of Sixth street, between Peach and Sassafras streets, - - - -	42 07 49.3	80 05 45.23	5 20 23.01
3. The Light House, - - - - -	42 08 42.7	80 04 15.7	5 20 17.04
4. The Beacon Light at the lakeward end of the U. S. west pier,	42 09 16.7	80 05 07.5	5 20 20.5
5. Stone monument (supposed to have been placed by Andrew Ellicott); at the west corner of Parade and Front streets, inscribed as follows, viz: "1795 Lat. 42° 08′ 14″ Var. 0° 43′ E." - -	42 08 20.8	80 05 17 2	5 20 21.15
6. Depot of the Erie and Buffalo Rail Road, (the Passenger-house),	42 07 19.8	80 05 21.6	5 20 21.44

XXIII. CLEVELAND, OHIO.

In lieu of the last page under this head, substitute the following:

According to the above, we give as the approximate positions of other points in Cleveland, the following, viz:

POSITIONS IN THE CITY OF CLEVELAND, OHIO.	Approximate North Latitude.	Approximate Longitude West of the Meridian of Greenwich.	
		In Arc.	In Time.
1. The new Court House, - - -	° ′ ″ 41 30 05	° ′ ″ 81 42 06.1	*h. m. s.* 5 26 48.4
2. The Light House, situated at the southern corner of Water and Lighthouse streets, - - - - -	41 30 07.6	81 42 31.5	5 26 50.1
3. The Beacon Light at the end of the U. S. harbour-pier, - - -	41 30 16.5	81 43 01.1	5 26 52

Capital should read *Capitol* on pages 105 (line 26), 106 (bottom line), 108 (lines 2, 3, 6), 115 (lines 21, 22), 117 (lines 19, 20, 24), 119 (lines 2, 3, 11), of Proceedings No. 61.

The following donations for the Library were announced:—

Astronomical Journal, No. 127. Cambridge.—*From the Editor.*
Journal Acad. Nat. Sci. Philadelphia, IV. 2.—*From the Academy.*
Observations on the Genus Unio. VII. 1.—*From Isaac Lea.*
Quarterly Journal, Royal Dublin Society. XIV.—*From the Soc.*
Quar. Jour. Chem. Soc. XII. 2. (XLVI). Lond.—*From the Soc.*
Annales des Mines. XIV. 6 liv. of 1858.—*Ingenieurs des Mines.*
Estatutos . . . S. N. Neo Granadinos.—*From the Society.*
Med. News and Lib. No. 202. Phila.—*From Blanchard & Lea.*
Amer. Jour. Med. Sci. No. LXXVI.—*From Blanchard & Lea.*
Report on Deep River by Capt. Wilkes, 1858.—*From the Author.*
Geol. R. on S. W. Br. Pacific R. R. by Swallow.—*From the Author.*
Recherches sur l'origine des roches; Delesse.—*From the Author.*
Caloric; by Dr. Metcalfe. 2 Vols. Philada. 1859.—*Dr. F. Bache.*
Essais sur l'hygrometrie; Saussure. Neuch. 1783.—*Dr. F. Bache.*

The decease of the eminent botanist, Thomas Nuttall, a member of the Society (elected Oct. 17, 1817), in Lancashire, England, Sept. 10, 1859, was announced by Dr. Bache, and Mr. Durand was requested to prepare an obituary notice of the deceased.

A quorum for the enacting of laws not being present, the special business of the meeting was postponed.

A communication was presented for the Transactions, entitled Analytical Orthography; An Investigation of the Sounds of the Voice and their Alphabetic Notation, *by S. S. Haldeman, A.M.*, which was referred to a committee consisting of Prof. Lesley, Dr. Le Conte and Judge King.

On motion of Mr. Foulke, it was resolved that the amendments of the By-Laws shall be the special order of each stated meeting until finally disposed of.

Pending nominations Nos. 392 and 393, were read.

On motion of Mr. Trego, it was resolved that the Society of Naturalists of New Grenada, at Bogota, be made a corresponding Society; and the Society was adjourned.

Stated Meeting, October 21, 1859.

Present, fifteen members.

Dr. Wood, President, in the Chair.

Letters were read from the Hist. Soc. of Penna. dated Oct. 10:—from the Rhode Island Hist. Soc. dated Oct. 4:—and from the Bost. N. H. Soc. dated Oct. 6, 1859, acknowledging the receipt of the Proceedings.

The following donations for the Library were announced:—

Astronomical Journal, No. 128.—*From the Editor.*
Monthly Not. Royal Astron. Soc. XIX. No. 9.—*From R. A. Soc.*
Proc. Boston Nat. Hist. Soc. VII. 7, 8.—*From the Society.*
Journal of the Franklin Institute, No. 406.—*From the Institute.*
Proceedings Acad. Nat. Sci. 5–19, 1–2.—*From the Academy.*
African Repository, Oct. 1859. No. 10.—*From the Amer. Col. Soc.*
Cat. Off. and Students, Harvard Univ. 1859-60.—*From the Univer.*
Providence School Committee An. Rep. 1859.—*From the Committee.*
Chart of Canal de Haro, &c. Washington T.—*From Major Bache.*
Tavole . . Vecchia Moneta Tuscana, Fir. 1826.—*Prof. Haldeman.*
Della Campagna di Roma. By Reumont, 1842.—*Prof. Haldeman.*

The Committee, to which was referred the paper of Prof. Haldeman, reported in favour of its being printed in the Transactions, which was ordered accordingly, and the Committee was discharged.

The decease of the distinguished naturalist, Thomas Horsfield, a member of this Society (elected Oct. 16, 1829), at London, Sept. 1859, was announced by Dr. Leidy.

The decease of John Y. Mason, representative of the United States at the Court of the Tuilleries, a member (elected April 16, 1847), at Paris, Oct. 3, 1859, was announced by Prof. Trego.

A communication was presented for the Transactions entitled: Revision of the Buprestidæ of the United States, *by John L. Le Conte, M.D.*, and referred to a committee consisting of Prof. Haldeman, Dr. Ruschenberger and Dr Leidy.

Prof. Lesley presented for publication in the Proceedings a paper, entitled, On the Insensible Gradation of Words.*

Mr. Lesley brought before the notice of the members present, a measured and leveled section of the Geology and Topography

* See page 129.

of Kentucky made across the eastern part of the State, from Greenup County to the Tennessee State line, by Jos. Lesley, Jr., Asst. under the direction of Dr. David Dale Owen; State Geologist, in the summers of 1838 and 1859;—and described its most remarkable features along the western outcrop of the eastern coal field.

Nominations Nos. 392, 393 were balloted for, and new nomination No. 394 was read.

A quorum for the enacting of laws not being present, the special business of the evening was postponed.

The ballot being scrutinised, the following persons were declared duly elected members of the Society:—

Judge Henry Carleton, of Philadelphia.

Dr. Wm. A. Hammond, U. S. A.

And the Society was adjourned.

Stated Meeting, November 4, 1859.

Dr. Wood, President, in the Chair.

Present, sixteen members.

Letters were read from the R. A. Dijon, the R. S. Göttingen, the R. Geog. S. London, the R. S. London, the Mass. H. S. acknowledging the receipt of Proceedings Nos. 57 and 58;—from the Mass. H. S. Worcester, the P. H. S. Philada. and the State Librarian, Harrisburg, acknowledging the receipt of Transactions, Vol. XI. Part 2;—from the R. P. A. Berlin, acknowledging complete sets of Transactions and Proceedings;—from the N. H. S. Emden and R. P. A. Berlin, announcing the transmission of donations for the Library;—from the Librarian R. L. Rio de Janeiro, and M. Brockhaus, dated Leipsig, Nov. 10, 1858, informing the society of new arangements for correspondence with Brazil and South America.

A letter was read from Henry Carleton dated Philada. Oct. 24, 1859, acknowledging the receipt of notice of his election.

The following donations for the Library were announced:—

Greenwich Observations for 1857.—*From the Royal Society. Lond.* Teneriffe Astron. Exper. Lond. and Edin. 4to. 1859.—*From R. Soc.* Maxima and Minima, solved by Algebra, by Ramchundra. (200 pp.) 8vo. London, 1859.—*From the same.*

Proceedings R. S. London. Nos. 32 to 35. 8vo.—*From R. Soc.*
Philos. Trans. R. S. London. Parts I. II. 1858. 4to.—*From R. Soc.*
List of Members, 30th November, 1858.—*From the same.*
Report of the Joint Committee of R. S. and B. Ass. for procuring a continuance of the magnetical and meteorological observations, (16 pp.) 8vo.—*From the same.*
Proc. R. Geog. S. Lond. Vol. III. Parts III. IV. V.—*From the Soc.*
Peelpark R. Mus. and Lib. 10th An. Rep. (40 pp.) 8vo. Manchester.
Journ. Bath and W. E. S. 1859. Vol. VII. London.—*From the Soc.*
Proc. Geol. and Poly. S. W. R. York. 1858-9. Leeds.—*From the Soc.*
An. Rep. Leeds Phil. and Literary S. 1858-9.—*From the Soc.*
Journ. R. Dublin Soc. Nos. XII. XIII. 1859. Dub.—*From the Soc.*
Journ. R. Asiatic Soc. Vol. XVII. Part 1. Lond.—*From the Soc.*
Jour. S. Arts and I. in U. April-Aug. (May wanting.)—*From the Soc.*
Atlantis. No. II. III. IV. July, 1858-July, 1859. Lond.—*C. U. Dublin.*
Mém. Acad. I. Dijon. 6 vols. (1857.) Paris.—*From the Academy.*
Verhand. Natur. Ver. Bonn. 14 J. 2, to 15 J. 4.—*From the Univer.*
Jahresbericht 44th Natur. Ges. Emden, 1858.—*From the Society.*
Nachr. G. A. Uni. 1858, No. 1-28. Göttingen.—*From the Uni.*
Verhand. Gartenbau. 6 J. 2 h. No. 1-14. Berlin.—*From the Union.*
Monatsb. K. Preus. A. Berlin. July, Dec. 1858.—*From the Acad.*
Meteor. Inst. Berlin. Weather Tables for 1855-8.—*From the Inst.*
Jahrbuch K. K. Geol. Reichsan. 1858, IX. 4.—*From the Institute.*
Mittheilungen K. K. Geog. Gesell. 1859, III. 1.—*From the Society.*
L'Acad. Paris, Compte-Rendu. April, 1855.—*From the Academic.*
Trans. Acad. Sci. St. Louis, 1859. I. No. 3.—*From the Acad.*
Hartford Asylum. 43d An. Rept. May, 1859.—*From Directors.*
Hartford Retreat. 35th An. Rep. April, 1859.—*From the Officers.*
Gen. Ass. Conn. Minutes, June, 1859. N. Haven.—*From the Soc.*
Method of studying Physiology. J. A. Meigs.—*From the Author.*
Description of Skull from Jerusalem. J. A. Meigs.—*From the Aut.*
Cat. of Mammalia in the Museum H. E. I. Co. Calcutta. London, 1851. By Thos. Horsfield.—*From the Author.*

The Committee to which was referred the paper of Dr. Le Conte read at the last meeting reported in favour of its publication in the Transactions, which was ordered accordingly and the Committee discharged.

A quorum for the enactment of laws not being present, the special business of the evening was again postponed.

Pending nomination No. 394 was read, and the Society was adjourned.

On the Insensible Gradation of Words, by J. P. Lesley.

What practically happened years ago to every *fossil*—namely, to be studied in isolation, its surroundings and alliances unknown, is still to a great extent, the fate of those fossils of the intellectual world, *words*. When a word spoken by the people on this side of the globe is seen or heard to be like a word spoken by the people on the other side, if the meanings attached to its duplicate utterance can be allied, and especially if several such alliances can be catalogued, although merely as bald facts, ethnological reasoning upon origins and migrations is at once proceeded with. It cannot be denied that the science of comparative philology, although by no means in its infancy, labours under the defects of this rude method. Its grammars indeed are getting to be finished and proper tools for the scientific workman, but its vocabularies are still of a barbarous and impracticable kind, mere museums of popular curiosities. It still remains a subject for future demonstration, that in philology, as in palæontology, the boundaries of genus and species are to be accounted conterminous; that the organic forms pass into each other by almost insensible gradations; and that not by hazard but by plan; and finally not by a plan dependent upon the merely accidental variation of radical elements, but on a plan of the variable and alternate development of members of a complex structure.

Philology, as to its history, has three departments. First, the purely organic, containing all such involuntary or animal utterances, as the different species of men make, for the same natural reason that different species of animals quack, cluck, crow, scream, bark, bray, howl or roar, each with sounds fixed by the quality of its organs and by the emotions of its inner nature. It is to be expected that the child's organs will utter modifications of a given sound uttered with the same intent by an adult; and that one child will prefer guttural and another child labial utterances. It is reasonable, also, to expect that the African, the Malayan, the Esquimo, the Germanic groups of languages will be radically characterized by different soft and hard expressions, by liquid prefixes or guttural affixes, by sibilants, chucklings, and murmurs of their own, as we find they actually are. The study of this department has been vigorously prosecuted in one direction by able men, among whom, in this country, Kraitzer and Haldeman may be named as taking the lead. These have pointed out a multitude of true natural expressions. They tell us, for instance, that the Latin ex, K, S, and the English ou-t, may

be known by the very sound itself to mean expulsion from the inside outward. And so of many other words. But the range of this investigation has been hitherto kept narrow by the neglect of the other direction in which these studies should move on. No one has yet seriously taken up the true characteristics of natural language, such as the clucks of Oregon and Caffraria, the final K of the hypoborean race, the infantine TL of Mexico and other local regions, the softly vocalized finals of Southern Europe, the utter abandonment of the Polynesian race to vowelism, the monosyllabic humour of the Sinitic stock, to study these in the same spirit with which Gardner and Nuttall studied the sounds of birds; to study them, in fact, in connection and in harmony with other specific differences of men not as *men*, but as *animals*. Yet until this is done, comparative philology has obtained no starting point.

The second department of philology is that of pure Bardic or Mythologic words—words which are to be studied as *inventions* and not as *involuntary organizations;* to be regarded truly as fossils, scattered, fragmentary, inverted, pseudo morphed; and, when understood, instructing us far more likely about migrations of mind than of body; rather about the exodus of priesthoods and sects than of races; about a picturesque, mysterious propaganda of symbols by priests and their initiated, and not about the carriage of household sounds, war cries, or love whispers, from one locality or habitation to another, by men still half animals.

And the third department of philological investigation deals with these same empirical constructions, these originally crystallized bardisms, not in their first forms, but in their secondary or sedimentary condition, as words broken down, pulverized, readjusted and cemented; as words with some of their elements abstracted and with new elements infiltrated; tinged by climate and social habits, and metamorphosed by the logic, art and science of successive generations. To use a geological simile, there are many *primary* regions of philology like Bretagne and Western Ireland, Northern Spain, Dalmatia and the Caucasus, Ceylon, New Holland, or any other remote and secluded lands, where the elementary sounds of the ancient wordmakers still present themselves for comparison and analysis almost in their original phases. On the other hand most of the languages of the world and all the languages of the historic, artistic and scientific nations are of a genuine *secondary* order and need to be studied first as to their grosser ingredients, and these again secondly in a finer analysis. And one object of the charts presented here is to show in

reference to this last, that a few elements of a primary order are everywhere employed in language as in chemistry, to construct elements of a second order and a third and a fourth, by a few simple laws of change, in such a series of gradations, that any word out of the thousand used commonly by any people may be selected indifferently and discussed with the same results as any other word; that even any given compound word will be found present in some well recognized form in nearly all the languages known, and yet will have different meanings in most of them; that there is therefore not the most distant approach to a common or universal language for all mankind beyond the fact that all use the same elements in the same endless round of composition, and cannot get out of this round; that the presence of the same words in two or more languages is therefore no prima facie evidence of kinship between the two or more tribes speaking those languages; that, therefore, ethnology cannot be considered as having yet taken hold of philology as one of its tools by the right handle, or turned it to any useful purpose beyond the determination of very local questions. It can be shown, probably, that the study of philology must be distributed between—first, a strict investigation by expert naturalists into the primary animal sounds made by the species or varieties of mankind; secondly, an investigation of those words in hieroglyphic, classical and mediæval history and mythology which remain to represent those old introduced non-animal, transcendental ideas by invented signs, by arbitrarily attached sounds, and by mysteriously arranged syllables; and thirdly, the classification of all words used to express such ideas in modern times, according to the laws now so well understood and obeyed in the study of chemical elements, fossils, and objects of the actual nature.

The charts appended to this paper will speak for themselves in explanation of these views. They represent the gradual passage, through groups of forms, of the names which mankind have given to the five objects, MAN, HEAD, HAIR, HAND and STONE, in 200 languages, more or less. They have been made up from the Russian Comparative Vocabulary of Catherine I, from the Mithridates, from Comparative Vocabularies of the dialects of the Caucasus, from Hale's Volume of the Exploring Expedition, and a few other sources of information open to all. Very few of the African words, however, are given, and only enough American words for comparison, as the object was to illustrate the subject, not to furnish a perfect specimen. In selecting letters the expression of the sound has been kept in view as the primary object, where it did not conceal the graduation. Hence

K is used for C, TJ for Tsch, &c. but no rule has been exactly observed throughout. Sometimes Sh is expressed by S, at other times the importance of the H is shown by writing it in full.

The chief design has been to show how by prefixes and affixes, by the dropping out of medials, and the rejection now of the first and now of the last element, an almost infinite series of changes not only can be permitted, but have actually realized themselves in the languages and dialects of the earth; how that no idea can be technically said to be expressed by man labially, or dentally, or gutturally, or nasally, seeing that the very same series of dissyllables which in one direction ends in a single labial, is sure, when followed in another direction, to end in a dental, and when followed in a third direction, to end in a guttural or nasal; while the very same simple guttural, dental, or labial, reappears in the different series as a vehicle for different ideas. To illustrate by an example or two:—

HAIR, from such double full forms as GURuGURu (197), CyPy' HUiR (153), tJe'RaChe'R (159), &c., passes down through one long range of changes to become a simple labial Fa (164), and through as long a range of changes in another direction, to become a simple dental oT (69). MAN passes on from similar full forms down to such simple forms as Mo, Tshu, or χoi. STONE becomes To, Ko, aL, aN, iSH and öFe. On the other hand, and to illustrate the other phase of the law, CaLGaSSen (137) means Hair,—KuDaCeS (58) means Man,—and CiT'XiN (158) means Head. MieZ (56), MeS (57), mean Man, while MaZda (171), MaZ (107), mean Hair. HaiR in English and XeiR Hand in Greek, GoiR Man and KeR Stone, cannot be distinguished philologically. Many other like instances will appeal to the eye, without further remark; and would be innumerable had we some scores of such tables made out.

It follows, from facts like these, that two theories respecting the great body of monosyllables must be adopted. First, they do not belong to the organic primary sounds by which our involuntary animal nature utters itself, and so their study in that department will be a failure. It is evident that a *stone* or a *bird* cannot relate itself indifferently to *all* the organs of speech in turn, if *that* be the kind of relation by which it gets itself named. If, for instance, its original organic name, not invented but simply exasperated by all mankind unconsciously, be TO, then it could not be KO, nor could it be ISH, nor AN, nor öFe. Are these then alterations? but if that be once granted, the science of Comparative Philosophy commits suicide. Secondly, the great body of monosyllables so far from being originals

are fragments. All language is a breccia, or rather it resembles the great fossiliferous lime-rocks of the coal measures, full of the parted joints of encrini, once connected into living, waving, propagating stems and flowers of stone. In the construction of charts like these one can see how the stems came to be disjointed, and the isolated discs to be so strewn hither and thither among the secondary sediments of speech, the dialects of different tribes. To illustrate this: here is one actual formula of fragmentation.

G	U	Ru	G	U	Ru			197
	U	Ru		U	Ru			
		Lo		U	Ru	Hair		196
			H	U	Ru			191
				U	Ru			196

Here we have the reduplicated form of the compound guttural, labial and lingual, and the dropping away of one part after another, until nothing but the end remains.

The selection of these five particular objects of speech was made because they are among the most familiar to men, and have simple or unequivocal meanings, and therefore ought to be named alike in all languages, if such a fact were possible. Yet we see how they merely play different groups of runs upon the same gamut. They were selected also as good examples of a principal or type arrangement of the elements in the full form, Ka Ba Ra Ta, the historical meaning of which I have endeavoured, in papers read before the American Association, to illustrate. There are undoubtedly many such type forms, all of which can be wrought out by this method of visible classification.

The positive results to be arrived at then seem to be these—1. The same radical sound, Ba for example (modulated of course as Pa, Fa, Va, Wa, Ma), can be found in a large majority of languages, standing as a name for a majority of the objects of thought expressed by speech.

2. In the midst of this apparent wilderness of confusion, a very evident order will come to view, when all the sounds employed to represent one idea are classified in vertical columns; and this order will consist in their various *groupings*. Each idea is indeed expressed by all the signs known to the ear of man, but is *most often* expressed, or in other words is expressed by *the greater number of mouths*, in one kind of way, that is, by one group of analogous words larger than all the other groups. The idea will be recognised as having, so to speak, a greater run upon one set of elements or combinations. And we may hope that as Lesquerox has succeeded in recognizing each

successive coal bed, not so much by any individual fossil, as by some different group of plants, the plants themselves being nevertheless found in higher and lower beds than the one so marked, we in like manner will be able to distinguish languages ethnologically by this grouping of forms of words common to all, under special ideas.

3. Charts like these prove the reality of certain facts in philology sometimes doubted; the reality, for instance, of *derivative reversion;* as in the Greek λογ, Hebrew קול; Go-bo-l, becomes Go-lo-ba, &c. This will be of importance in discussing the kinship of neighbouring nations with inverted names such as Dorians and Rhodians, Italians and Latins, Berbers and Arabs, &c. I have pursued my own researches for some years with this in view as an established fact, that the boustrophedon manner of writing is a reality in etymology and ethnology, as it was in mythology and common history. It made no difference to the inventor of a word whether one symbol or another came first, for he did not write to express a previously known sound (as we do), but set down the symbols of his ideas and afterwards *accepted* the sounds they gave him. In other words, in this department of philology letters make words and not words letters.*

4. It seems to be evident that the liquids and dentals, as a rule, *replace* each other not by *alteration* but by *alternation*, for none of these columns worked well until the L's and R's were put under one head and the Ts, Ds and N under another. There are, of course, many exceptional cases of true organic mutation.—In like manner it seems clear that the terminal NG of many languages is not a mere nasality, but that the G is the relic of a lost syllable beginning with a guttural.

5. The loss of consonantal elements is seen to be indicated by the presence of diphthongs or groups of vowels, and especially by the concentrated diphthongs O and U. Also, the fact appears that not only any diphthong, but any strong vowel, can in time come to replace not the labials only but any one of all the consonants; and our only salvation from this utter confusion to result from such a law—a veritable law of disorder or decomposition—is a systematic and general classification of words, not according to men's theories of etymological relationships, but in a mechanical way, as we classify fossils and

* Dr. Pickering has drawn my attention to the curious adventure, reported by Hale, of certain New Zealand savages who were drifted to another and distant island, and commemorated their salvation on its shores by deliberately reversing their whole vocabulary, pronouncing every word backwards.

minerals, in tables and in columns, to let their groupings reveal themselves, and then we can begin again with our philological arguments on ethnology.

Some of the Changes through which the Word STONE passes in

P T			Egyptian, shaft of a column, (Bunsen)				
Pa T	} (13)		Celtic				
La B	}						
Te B		50	Lesgin (antsug) Caucasia,				
Di Pa		(171)	Pehlvi				
Te Bou			Karib	} American.			
Tu Mu			Sapibocoro				
Ru Mi			Quichua				
La Pi S		(22)	Latin				
La a S			Greek				
La Pi De		(23)	Italian				
Pa Ta R		167	Moultani	} India			
Pa aT R		168	Bengali				
Pu Θu R		169	Decan				
Py TTeR		(177)	Malabar				
Pe T Ra		21	Romaic				
Pe D Ra		26	Portughese				
Po r Ra		29	Vallzan				
Pi eT Ri		46	Volosch (Walachian)				
Pi er Re		(28)	French				
Pe i Ro		(27)	Romance				
Pi o R Na		25	Spanish				
Bo i Na		162	Kurile Isles, E. Asia,	} E. Asia.			
Pj u N		126	Tomscago ocr				
Fu a LLa		125	Tavgin				
Fa TTu		188	Magendie, (Australia).				
ü Fa Tsh		160	Kamschatka (Joznye)	} N. E. Asia.			
Ua Tsh		158	,, (Tigil)				
a Tu R	}	80	Dugor	} Caucassian			(N. E. Asia.)
Do R							
Du R		79	Oset		∞	RTo	168 Tangutch
Ta RRua		15	Basque		∞	RoT	Coptic (Sand.)
Je Re Ra		(171)	Pehlvi		∞	LiΘος	Greek.
Dzo La	}	145	Lamut N. E. Asia.				
DzjuL	} {	144	Tungus Ocotsck Sea				
Jo L	{	64	Tshjobasch in Russia.				
Dzo Lo		(143)	} Tungus	} N. E. Asia.			
Sho Lo		(141)					
Zhu Lo		(146)	Tschapogir				
Jio LLo		(141)	} Tungus				
Zho LLo	}	139	} Tungus				
DiSo LLo							
Ja Lo		138	} Tungus				
TshaLo		135	Mongol				
TsheRu		117	Casi-cumit	} N. E. Russia.			
TshaR Tsh		119	Acuschen				
TshuLu N		137	Calmuck	} E. Siberia.			
Sha Lu N	}	136	Brat				
Tshe Lo N							
STi R N		38	Islandic	} Europe.			
STa ai N	}	36	Cimbric				
STo a N							
ST a N							
ST ei N		35	German				
ST ai Na		33	Teutonic				
ST ai Ns		30	Gothic				
ST eo N		(40)	Dutch				
ST e Na		(13)	Celtic				
ST o Ne		32	English				
ST a N		31	Anglo-Saxon				
ST e N		34	Old high German				
ST eeN		37	Danish				
ST e N		39	Swedish				
ST i NG		41	Frizian				

Ce T Rus	12	Susdalian (Europe)	
Ha DzaR Ge Je R	85	Arabic	
Hi Ntzo Zo	118	Andŭ (Siberian)	
Gi T	(152)	Lumpocol ,,	
Co Du	(27)	Romance	
Ge D Ca Ca i LLe	58	Lopar (S. Russian)	
Ce Ra	116 115	Tuschet Ingreshet	Siberian Tartar
Gu R	45	Albanian (Greece)	
Gu L	53	Lesquiz-dido (Caucasus)	
Ca Lo C	16	Irish	
Ca La Zh	17	Gaelic	
Ca RreG	(18)	Welsh	
Tu La K	114	Tschengis Tartar.	
u Ju Ra K		Greenland Esquimaux	
Ro CCo	24	Neapolitan	
Ro CK		English	

Te R P — Comanche

Cu	66	Vogul	Russia N. E.
Cy	(63)	Tscherimiss	Russia N. E.
Cj e	47	Wenger (Hungary?)	
Ce i	(40)	Dutch	
Cj Ui	(63)	Tscherimiss (Russia N. E.)	
Ce U	(71)	Oseti, 2.	Caucasus
Ci B	70	Oseti, 1.	Caucasus
Co B	(67)	Vogul, 2.	Russia
Ce B	61	Mord	Russia
Ce B	62	Moscow?	Russia
Ci Bi	56	Corel	Russia
Ci Bi	(55)	Ostland	Russia
Ci Bi TShiBi TSi Bi	54	Tschjochous	Russia
Ci BBi	(55)	Ostland	Russia

Ta	NGa	131	Taigin } Polar-Russian						
Ta	NGaiT	(130)	Carassin }						
Tu	NuNG		Lake Macquarie (N. Holland)						
De	Nai	123	Samoiede	Tschuktsch N.W.Am.		Ui	Ga	K	
i	NGa	142 } Tungus		Armenian	(107)		Ga	Ca	R
i	Na	141 }		Maltese	86		Ha	G	Ra
Sa	NGa	(177)	Malabar	Abassinian	113		Hau	C	
Se	NG }	76	Persian	Abassinian	112		Ha	C	
Sa	NG }			Illyrian	(3)		Cu	C	
Se	NC	77	Koord	Osetian, 3, 4.	72		Co	χ	
Se	NG	102	Bocharian	Osetian, 5.	74		Cuu	χ	
Sa	Xum	(22)	Latin	═══Romance	(27)		CoCS		
Sa	SSo	(23)	Italian						
Shi	Sh	149	Cotob } Asia						
Shi	Sh	150	Assan }						
Shi		164	Chinese (Cipaisk)						
i	Sh	161	Japanese (Eponsk)						
Zha		(146)	Tschapogir N. E.						
i	Z	59	Zuren Asia.	Cabarda			My	Vy	
i	Z	60	Permian	Caucasian	111		My	VVa	
i	Z	65	Votet	Camashin	132		Fi		
Tsi	S	(27)	Romanch	Carassin	(130)		Py		
Tshy	S	152	Lumpocol	Samoid	(128)		Py		
Tye	S	151	Inbat	Coibal	133		Pi		
Ta	S	88	Turian	Samoid	127		Po		
Ta	S	89	Kasan	Samoid	129		Po		
Ta	S	90	Mestsh.	Osetian	(75)		Pj	u	
Ta	S	91	Bashkir	Samoid	(123)		Pu	i	
Ta	S	92	Nogai	Polynes.	197		We	i	
Ta	S	93	Rodac	Samoid	121		Pa	i	
Ta	S	94	Tobolsk	Samoid	120		Pa	o	
Ta	S	95	Tshatsc				Pa	Co	
Ta	S	96	Tschol.	Manchu	163		Fe	χe	
Ta	S	98	Cusnet	Tschjoc.	157		Fu	Go	N
Ta	S	99	Barab						
Ta	S	101	Teleutsch						
Ta	S	103	Khivan						
Ta	S	104	Kirguis						
Ta	S	105	Turcoman						
Ta	S	106	Ecut						
Ta	Zh	97	Enesei Tartar						
$^{a}\chi$ To	S }	58	Vogul on Tscherdyma						
$^{a}\chi$ Ti	T }								
Ge	T	So	48	Abari Caucasian }					
χ^{s}	T	So	51	Lesquis dzar }					
i	T	So	52	,, χunzag }					
$^{a}\chi$	Ty	T	69	Vogul on Berezou					
$^{a}\chi$	To	T	67	,, on Bercoturs k.					
Ho	Ta	Tai							
	Te	Te Te		Cora (New Mexico)					
	Te	TL		Mexican					
	Te			Koljusch N. W. coast America					
i	Ta			Brazil (3 dialects)					
	To	i	(128)	Narymscargo ocruga (Samoyed)					
	To		(71)	Ostet on the Naryma (N. Russia)					

Ci	Pa			87	Assyrian	S. E. Asia.
Ce	Fo			84	Syrian	
C	Ua			109	Imeretian (Caucasus)	
Ce	Fa			110	Cuban ,,	
Ce	Fa			108	Cartalin ,,	
Ce	Fa	R		(107)	Armenian	
C	Ua	L		155	Corean	N. E. Asia.
C	Ua	Li		159	Kamschatcadale, 2.	
Gi	Be	R			Sidney	New Holland
	Bu	Ra			Muruya	
	Ma	Ra	Ma		Peel River	
	Yu	Ru	BaNG		Bathurst	
	Wa	La	NG		Wellington	
	Ba	Re		166	Tsygan (Himalaya?)	
	Be	R		(177)	Malabar (India)	
	Me	a	N	19	Cornish	N. W. Europe
	Ma	o	N	14	Breton	
	Ma	o	N	(18)	Welch	E. Europe.
aC	Mu	o		42	Lithuanian	
aC	Me		NS	(43)	Lettish	
aC	Me		NS	44	Crivingo Livonian	
Ca	Mj	e	N	(3)	Polish	
Ca	M	me	N	(3)	Illyrian	
Co	Mi		N	8	Polabsk	
Ca	Mi		N	0	Russian	
Ca	Mi		N	1	Old Schlavonic	
Ca	Mi		N	4	Bohemian	
Ca	Mi		N	5	Serbian	
Ca	Mi		N	6	Wendish	
Ca	Mi		N	7	Sorabish	
Ca	Mi		N	11	Malo-Russian	
Ca	M		N	2	Slavo-Hungarian	
Ca	M			9	Cashub	
Gu	FF	o	N	153	Corean (E. Asia).	
Oi	F	e	N	82	Zidonian?	S. W. Asia.
a	F		Nu	83	Chaldee	
ö	F	e	N	81	Hebrew (אכך)	
ö	F	e		(27)	Romanch (S. Europe).	
Ko					Hungarian: Stone	
Ko	Va				Hungarian: Flint	
Ko	Mo	C			Hungarian: Sand	
Kö	Ve	CK			Hungarian: Gravel	
	Oo		Ne		Sahidic Coptic	
Pi,	the		oNe		Memphite Coptic	
masc.	artic		oNi		Sahidic Coptic	
			eNe		Coptic	
Pi,	,,		aL		Coptic	
	A		N		Egyptian (Bunsen Vol. 49).	

Before passing to another example, a few words seem necessary here. It is evident that the scheme of radicals to represent the above table of words is the following:—

T
P
LP
LPT
PT
PTR
TR
TRN
(TRP) once
TR K
R K
K
KB
KBR
BR
K R
K RK
K K

It is equally evident that this scheme would be improved, if it were not actually completed, had we the words meaning *Stone* in all the other languages of the earth, four hundred more or less. In which case assuming only the three principal contacts and keeping within the range of triliterals, it might be represented thus:—

P
PT
PTK
P K
TK
TKP
T P
KP
KPT
K T
TK T
P KP
P P
KP P
KP K
K K
K
K TK
TK T
T T
T

But if, as we see by the above chart would take place, instead of only the three primary contacts P, T, K, we must add the lingual L or R as distinct from T, and in fact a fourth primary element, while N plays a prominent role as primary grammatical affix, it is easy to imagine the great extent to which the perfected scheme will descend. The point of remark, however, is this:—the scheme is not one made up artificially like a row of arithmetical numbers or algebraic figures, to see how many different compounds of three or four or five elements exist *arithmetically* in the abstract; on the contrary, it results from a process of alternate growth and decay, of alternate additions and elisions, or of alternate expansions of expression and contractions, under the influence of two very different, opposite but co-ordinated laws of speech, by one of which the human mind endeavours always to enlarge and make more precise its words for better comprehension, and by the other to shorten and sweeten them for use. Thus language has a phyllotaxis of its own, by which its stem is regularly occupied to the utmost possibilities of the occasion.

As to the aboriginal meaning of these words for STONE, or which came first, or what radicals are original prefixes and what are affixes, these are recondite questions not involved in this discussion, and perhaps impossible to answer.

It may, however, not be uninteresting to point out as a possible key to some of these riddles, the form PTR, PTL, contracted to P'R, P'L, (Romance *Peiro*, Coptic *Pial*, c. Boina, Piorna, Pjun, Fualla, &c. &c. in the chart), which explains at all events the Greek πετρα, as P- Tor, the tor, the tabor, the taurus, the tower, meaning *the rock* or stone; and shows why the Apostle of the keys was chosen to bear the church. The sermon was on the mount. But these suggestions are foreign from the subject of this paper.

The Greek λιθος seems to be as true an inversion of tor, or tel, as the Tangutch RTo evidently is. And here mention cannot be omitted, however casually, of the intimate mythological connection between the ideas of STONE and MAN in language. RT was the Egyptian, ROT the Coptic word for both, while ReT meant form, species, sculpture; and herein lies the explanation: the principal bardic use of stone was to represent the human form divine, whether in sculpture on the native rock or propylon wall, or as set up in ambrose-stones alone or in circles, or as termini, caryatides, images, or columns in the temple. Idolatry being ancestral worship, the stone PaTaR had the same name as father, πατερ, and all standing stones were legendary giants, or patriarchs turned to stone in some past age of human magic

or divine wrath. Yet in the next chart which gives the words for MAN in the same languages (designated not by their names but by ciphers to save space) the whole grouping of the chart is different. A different aspect pervades the columns, and the prevalence of certain forms stamps a peculiar character upon the series.

Some of the Phases of the Word MAN.

Ma N	32, 36
Ma Na	30
Ma Nd	37)
Ma DuR	38
Me NeSCia	
Me NeSCe	37)
Me NiSC	31
Me NiSCo	33
Me N SH	
Mi e NiSHa	39
Me N SH	35, 40, 51
M I N SH	34
e NaSH	83)
e NoSH	84
NaSHa	17
I N SHaN	8
I N TH	85)
I SH	81)
O I D TS	163)
a I Nu	162
Mo No	Japan
Ma Nii	165
a I T	192
V I To	161
F I To	
Pa D SuL	85)
Ma Ni TSeN	177
M I Ni Ha	174
Ma NuSHeN	178
Ma NuSia	183
oRaN G	
BaaRaN G	194
Boo N	184
Ma NuSH	179, 166
Ma NuSH	169
Mu R D	
MuuR D	168
Me ReTe	170
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		C	S To		}	Mexican
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Se	a R					81
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NuiaT				Kuskatchewak
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hoMa	}	S. America).
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Bo PPe		Yaoi.
BouPou		Carib Islands.
oPouBou	}	Carib of the
ouPouPou	}	Spanish Main.
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Bui		63
Pei		18
Poi		54)
Pee		55
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Wih L	}	Delaware
Wi Le	}	Indian.
Wi L	}	New Sweden or
Wij R	}	Sankikani in
WyeR	}	N. America.
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Mie R		118)
ie R		65
e R		65)
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BuRua		Basque.
PuRa		Australian, Peel R.
PoLl		English.
P Re		62
P Re		61
VaRi		124
ShuB Le		Caucas. for forehead.
LaNC		Araucanian, S. Am.
Pa NC		68
Po NCe		69)
Pa NGa		67
Pa NCuN		66
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Be Gke		Aymara, S. M.
Pa Ccha	}	Yarura in
Pa Cchu	}	South America.
Pa Cuacua		Mobima, S. Am.
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aC aNG		Suaransch.
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iCaii		Mocabi.
aCa		Guaransch).
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Ga		Lo	Ba	O Russian
G		La	Va	1, 2, 3, 5
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		Na	Ma GaT	American
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	Ce M			49
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	Ca Po			24
	Ko Pf			34, 35
	Ca P			27, 46
	Ga P			13
	Co P			40
	Ga U			180
Ne	G Ui Lo			Mbaya, S. Am.
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Do Lo	Ci N			145
a R	Ce M			70)
T	Cu M			110
T	Ci N			53
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ReeS	}
ReoS	83
Ro Sa Ca	= "my head" in Betoi, S. Amer.
Na c sMu	} Othami
Na	} Mexican

Some of the Phases of the Word ***HAND.***

EeSe	Peru, Chequito.
iS	Lule, Paraguay.
iSiG	} Villelue ,,
iSi P	}
Po	}
Poo	|
Poh	|
Mbo	\} Brazilian Tribes.
eMe	|
GePo	|
cHoPa	}
iccHi Mo	} Lower
iccHi	} Orinoco
uCaBu Ho	}
NouCaBo	} Carib Isles
Nu CaPe	Maypure
La GeBa	165
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C UeR	50
χɛ iR	20
χɛ Ri	21
χi Ria	12
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C O L	98, 99, 42)
O L	86, 42) 89)
C U L	90, 94, 89) 91) 104
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	D	eShT	102)
	aD	eSh	100)
	D	uS T	109
T	S	eS Te	110
	S	HeShT	77
		HaS TaM	172
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	iDa		84
	eDa	}	81, 82, 83
	eD	}	
	FeN	}	86
	iT	}	

Many of the above combinations are proven by the fact of their occurring in the same language, the same group of dialects, or the same group of well studied alliances. Many others are easily disproved by criticism, being mere coincidences. And many are probably misplaced, as to the range of their radicals in the vertical rows, and might be placed to far better advantage to exhibit the law of insensible gradation. But the reality of the law is seen from these tables to be indisputable, and the further multiplication of tables will but heighten the illustration of the law. Arrange any one of the words of the Parable of the Prodigal Son, translated by the Antiquarian Society of Paris into the seventy or eighty local dialects of France, and the law is at once established. The most incongruous and dissimilar forms are seen to be organically derived from one another. The French words *fils* and *garcon* and the English *booby* are but widely separated

fragments of a series of forms regularly graded like the words of the preceding tables. Bou-eBe, Bou-Be, Fiu, Fieu, Fi, Fe, FaiL, FiL, FiL-G, VaL, VaLeT, FaNT, afFaNT, eNFaNT, eNFaN, afFaN, aFaN, eFaN, eFoN, MeNioT, MeNeGe, MaiNaChé, G-aR-ChéeN, GaRChouN, GaeChoN, GaiChoN, GouGeaT, GouiaT, Gouia, GaRCouN, GaRCoN, GaSSoN, HiL, and an abnormal form DRoLei, belonging to some other series, or to a part of this series too distant to appear more than this once among the French patois; in fact a word bearing the same relation to the English DRoLL that FiL does to FooL, that Boube does to Booby (German Bube, Boy), &c. &c. The most interesting point of this series is the change of FiL to HiL, through some lost form H'FiL or G.FiL, the reverse of which still remains in FiL.G, MeNaGe, &c. This lost form is found in other languages; as in the Dshar Lesguis Caucasian KiMiR, Child, contracted in Hungarian (as in French patois) to Gi'eR-mek, child. In the Lesguis Antshong and Chunsagh, on the contrary, we have TiMiR, the original, so to speak (through Ti'eR), of the French patois DRoLei; as in the Georgian Suaneti we have BoBosh (Imeritian Boshi) to explain the French patois BouBe, a contracted repetition of the original Hebrew form BaR-BaR, the diminutive of BaR, boy.

Stated Meeting, November 18, 1859.

Present, eighteen members.

Dr. Wood, President, in the Chair.

Judge Carleton, a new member, was presented by Dr. Bache.

A letter was read from Dr. W. A. Hammond, U. S. A. dated Fort Mackinaw, Michigan, Nov. 5, 1859, acknowledging notice of his election.

The following donations for the Library were announced:—

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African Repository, XXXV. No. 11. (Nov.)—*From A. C. Society.*

Columbia College Annual Catalogue. 1859-60.—*From the College.*

Inau. Addresses by T. W. Dwight and G. P. Marsh.—*From the same.*

Pasigraphie mittels arabischer Zahlzeichen. Ein versuch von Moses Paic. Semlin, 1859.—*From the Author.*

Natural Philosophy, by B. Hobson, M. D. London Miss. Society, Canton, China; in Chinese, unbound.—*From Dr. F. Bache.*

The death of M. Guillaume Theophile Tilesius (elected 1819), a member of this Society, was announced by Dr. Bache.

On motion of Dr. Bache, the following biographical notice of John Reynell, read June 17, by Dr. B. H. Coates, was ordered to be printed:—

The writer of this was, a few years since, invited by a deceased president, to furnish to this Society a brief notice of the above named member, for preservation in the archives. He has done so, in part out of reverence for the wishes of the distinguished individual alluded to, but also partly from a conviction that it is useful and honourable, in associated bodies, to procure and retain such memoirs. "Stare super antiquas vias" is pre-eminently the motto of learned incorporations; and, if it be thought to contain within it much that is objectionable, let us not fail to gather from it its proper and praiseworthy fruits; among which are stability, moderation, impartiality, and the opportunity of benefitting by the example, for good and evil, of those who have preceded us.

John Reynell was the son of Samuel and Sarah Reynell, and was born at Bristol, England, June 15, 1708, old style; but was brought up at Exeter, in Devonshire, the residence of many of his relatives, at which individuals among them continued to reside after his death. His family was, at one time, of some note;* and several branches of it are said still to hold liege landed possessions. He was designed and educated for a merchant; and was sent, in a commercial capacity, to reside in the Island of Jamaica, at the early age of eighteen years. His advisers appear to have set as high a valuation on the activity of youth as is done at the present day; and Young England, in him, to have not been inferior in enterprise to Young America.

He was at that time under strong religious impressions. At his removal to Jamaica, he is found a member of the religious Society of Friends, in which it is inferred that he had been educated. He was diligent in the attendances expected of him in his religious connexion, and in efforts to obviate breaches of morality which he believed to be

* Barbe's Commoners; IV. pp. 446, 456. &c.; and Fuller's Worthies, Article Devonshire. Sir Richard Reynell defended the City of Exeter and Launcester Castle for Richard Cœur de Lion, against Prince John, afterwards King John Lackland. Sir Hugh Reynell was a Master and Governor (not to be confused with Grand Master) among the Knights of St. John of Jerusalem, A. D. 1275; and the small harbour of Port Renelle, in the Island of Malta, received its name from this Knight, and still retained it in 1838.

too much indulged in the island. These were chiefly connected with slavery, illicit intercourse, and intemperance. He was not an unqualified opponent of slavery in all cases and under all circumstances; and retained one slave with him in the United States to a very advanced age, tolerating and comforting many infirmities and eccentricities. The efforts and remonstrances of John Reynell in Jamaica were not well received; and it was in consequence of this that he ultimately settled in Philadelphia in 1728.

In our city, he soon acquired the confidence of his acquaintance, after a moderate interval, a solid and commanding character, and, finally, a rapid success. After another interval he assumed a style of liberal hospitality, and maintained a large establishment; and he closed by an adequate provision for those dependent on him, damaged only by the derangements in business caused by the war of the revolution. By far the most important of these was the receipt of debts in paper money; Reynell, in common with all Quakers, and many others, not being willing to descend to the payment of his own obligations in the same imaginary representative of value.

John Reynell was not an ambitious man; and by no means betrayed eagerness to have his name frequently before the public in connection with politics or corporate bodies. It occurs in but few instances, and he seems to have acted on the principle ascribed to Cosmo de Medici and President Jackson, never to seek for public office, but only to accept it when the undeniable wish of their fellow citizens. He may have been of opinion that his time was better bestowed, first, upon his private affairs, and then upon institutions in such limited number that he might feel confident of giving adequate attention to the service of them all; rather than upon a diffused mass of objects, exposing him to the risk or certainty of occasional neglects. I have found records of him in only two or three of the incorporations of the city. Of these, two were literary, and the third, charitable, the American Philosophical Society, the School Corporation established by Penn, and the Pennsylvania Hospital.

Of the body I have now the honour to address, he was a foundation member; having been elected to the branch styled "The American Philosophical Society," and of which the president was Governor Hamilton, January 26, 1768; and becoming a member of the joint society by the union of the two original bodies, January 2, 1769. By this election of a man of sixty years of age, and much occupied with private business and the affairs of a religious body, and that during the short interval between the stamp act troubles and the more imme-

diate movements towards a civil war, it is not likely that the Society expected direct labours in the way of philosophical research. It is a high and valuable testimony of esteem for the man, and implies the ascription of character and influence.

The corporation of "Overseers of the Public Schools founded by Charter, in the Town and County of Philadelphia," but supported exclusively by private munificence, has never appeared to court popular applause, but has been long known to many among us for unobtrusive usefulness. It is not forgotten in the maintenance of a series of schools, distributed through the city, and intended for the instruction of the middle classes, as well as for the education of a number of the poor, whose reception of assistance from charitable funds was kept a profound secret even from themselves. So careful have been the Overseers to preserve that self respect of the unfortunate which has been deemed by philosophers the best safeguard against the increase of pauperism, that, in place of enjoining, as has been the case in some parts of the world, the observance of an absurd, ugly, antiquated and ridiculous uniform, care was taken, on the other hand, that no peculiarity of dress should distinguish them from their more prosperous companions; and if necessary, the parents of these children were aided in procuring for them the materials for a decent and respectable appearance. The institution was also known for the support of a Latin and Greek Seminary, which, till a period not far remote, was acknowledged to be the best preparatory school for college in this part of the United States. A learned and eminent writer in an inland town, has lately stated to a sister society that he had not heard much of the eminent men educated at it. There has been, until about the last thirty years, but little of what was eminent in our city that did not owe an important part of its education to the Quaker School, in Fourth Street; and in many cases, it furnished all, with the exception of professional instruction. It is not universally known that it furnished many courses of lectures on popular science, and carried its care for astronomy and its liberality in the supply of instruments, and the employment of observers so far as to furnish, for many years, the only observations made in this country, fit to regulate ships' chronometers. For this I quote the report of a Committee of the Councils of New York. It has not found equally favourable notice in some of the histories of astronomical labours in this city.

John Reynell was made a member of this body October 8, 1742. He became Treasurer in 1760; and his services, and those of his predecessor, John Kinsley, furnish a curious instance of the customs

of the men and of the time, and perhaps a lesson not without utility at the present day. I have collected it from a careful examination of the minutes of the board. Kinsley had fallen into the slow illness which was ultimately the cause of his death. His habit of mutual and implicit confidence with the board, together with his illness, had occasioned his accounts to grow a little behind hand in settlement; but instead of this giving rise to the retention of money belonging to the Institution, as has been charged in some well known instances, it had the reverse effect of inducing him to advance his own funds for the public service. In the first instance, friendship, and afterwards the instructions of the board, induced John Reynell to assist him, both by settling his accounts for him, and by advancing Reynell's funds for the common service; both of them feeling that the charitable and educational institution must not be allowed to suffer. At length, on the demise of the old and confidential Treasurer, a minute of respect and regret was recorded; but no successor was appointed, and business, when occasion offered, was only referred to John Reynell to fulfil the duties which belonged to that office, until, at length, and as if accidentally, repeated recognitions of him in that capacity had taken place. It may be fairly asked whether modern changes in such habits have given rise to much improvement.

Of the Pennsylvania Hospital, John Reynell was also Treasurer, and was the original one, having been elected during the organization, July 1, 1751, new style. At the annual election, in 1752, he was removed from the Treasurer's office, to be made a manager; and his place was supplied, in the prior capacity, by Charles Norris. We may imagine that he here also acted upon the principle of not undertaking too many duties; and he may have thought that the Treasurership, which he had been exercising in the manner we have just described for the previous two years, was sufficient. He was continued manager for twenty-eight years, and for the last twenty-three of them as President. He declined re-election at the annual meeting in 1780.

During the troubles which preceded the revolutionary war, John Reynell acted in a manner consistent with his character. He was a whig who disapproved of civil war. His name appears signed to the Address of the Merchants of Philadelphia to the people of the Colonies, against the Stamp Act. Deeply imbued with a sense of the destructive tendency of all military struggles, and of opinion, as he repeated it, that the worst of all wars is a civil war, he could not in any way promote the sanguinary struggle with England. In peaceable resistance, on the other hand, he was active and persevering; and he

believed it possible, by non-consumption of British manufactures, to compel a just respect to colonial rights. The present writer does not here enlarge upon this fruitful topic. Much may be said in favour of peaceable resistance; and to show that, if the United States had not been separated from England, it would have been preposterous for the latter power to pretend to tyrannize over them, that many valuable sources of advantages would have been preserved, enormous destruction avoided, and that at a day not far removed from the present time, the gigantic colony would have superseded the parent as effectually as Syracuse did Corinth, Carthage Tyre, Athens the Egyptian or the Hellenic Thebes, or Rome Alba Longa.

John Reynell remained in Philadelphia during the whole war, and preserved the respect of every one, but was certainly not in the war to achieve political glory. Commerce was effectually superseded by the blockades and hostile occupation of the city; and when peace was restored, the energies of a man of seventy-three years of age could not be expected to push it to any active rivalry with younger men. Three or four years before the close, he took a nephew of his wife into partnership; and some two years later, transferred the remainder of his business to his younger partner. His death took place by a gradual decline of about four months, with little definite disease, and which terminated September 3, 1782. In his last confinement he was attended by his friends Drs. Kuhn and Foulke.

He was married, April 15, 1756, to Mary Nicholas, widow of Samuel Nicholas, and daughter of Thomas and Beulah Coates. By this connexion, he had four daughters and a son; all of whom, however, died in early infancy, except a daughter who nearly attained the age of fifteen years. Mr. John F. Watson records the death of this young lady by drowning, in that branch of Dock Creek which crossed Chesnut street below Fourth street, near or at the ruinous bridge. Mr. Watson is unable to give me his authority for this. I find no mention of it in the newspapers of the time; the reports of the grand juries are not easy of access; and I have no tradition of the circumstance. The record in the family bible merely relates that she died "early in the morning."

As far as has been gathered from incidental indications, John Reynell appears to have been of the middle size, of considerable bodily powers, very good health, and a dignified and imposing aspect. His manner was grave, quiet and somewhat taciturn. His signature is bold and masculine; and resembles that of John Hancock. There is no portrait of him. Although conforming to the requirements of

the religious body of Friends, in preserving a plain appearance and using sober colours, he did not observe any peculiar dress, or deviate in any remarkable degree from the custom of the time. He used snuff and smoking tobacco freely. He did not advocate abstinence from wine, or even from ardent spirits; but was earnest in enforcing moderation and temperance.

His mind, naturally endowed with great energy and decision, was cultivated upon antique models; and he had read history, "Stare super antiquas vias," though not quoted, was evidently the basis of the acquired part of his character. He was not without prejudice in favour of birth, and advised a young person to connect himself with "a good stock." He had great confidence in character; aimed at it himself, and praised it and confided in it when met with in others. He was eminently moderate, steady and permanent in all his views. This extended to commerce, which he considered as the business of a man's life, and a thing that ought to be habitual. He does not seem to have aimed at accumulating a large fortune. This is shown by his liberal housekeeping, and the extent of his contributions to charity. During his last illness, it was unexpectedly discovered that, in addition to liberal contributions of every sort, he had, for many years, distributed among the poor an amount equal to one half of all his expenses of living, in absolute and total secresy.

Commerce was steady and profitable; speculation scarcely existed; and there were no banks. But he was equally liberal of his time in the service of others. Besides the secret investigations of poverty just alluded to, and the service of institutions, he was more remarked for healing differences among his neighbours and acquaintance than perhaps any other man, and his awards were almost always adopted as decisive.

His personal influence was very great; and several of our most eminent citizens placed their sons with him, to live in his house, according to the custom of the times, in order to acquire a knowledge and the habits of commerce. Among these elèves were Dr. George Logan and the noted Timothy Matlack.

John Reynell had read extensively; was by no means indisposed to wit and satire, and valued the writings of Swift. He was aware of the value of science, as may be judged from his adhesion to this Society; and his name appears among the subscribers to our first volume.

At his death the most honorary mention of his usefulness and high

character was made public from the most diverse sources; and the general love of the citizens attended him to the grave.

Pending nomination No. 394 was read.

No quorum for the enacting of laws being present, the special business of the evening was again postponed; and on motion of Mr. Foulke, the Secretary was instructed to give special notice of the fact to each of the members and request a punctual attendance at the next meeting.

The records of the last meeting of the Board of Officers and Members of Council were read.

On motion of Dr. Harris, the Committee on the Hall were instructed to place a new carpet on the hall floor.

And the Society was adjourned.

Stated Meeting, December 2, 1859.

Present, thirty-three members.

Dr. Wood, President, in the Chair.

The Hon. Wm. B. Reed was presented by Mr. Fraley.

The following donations for the Library were announced:—

Gould's Astronomical Journal. No. 129.—*From the Editor.*
Jour. Soc. Arts and of the I. in U. May, 1859. Lond.—*From the Soc.*
Das Astronom. Diagram; von Dr. Prestel, 1859.—*From Dr. Wilson.*
Academic Fallacies by H. Coppée, Phil. 1859. 8vo. p.—*From the Aut.*

The reading of Mr. Durand's obituary notice of Mr. Nuttall was postponed to the next meeting.

The death of Washington Irving, aged 76 (elected a member April 17, 1829), at his residence, Sunnyside, on the Hudson river, Nov. 28, 1859, was announced by Dr. Bache, and on motion of Dr. Elwyn, Prof. Coppée was requested to prepare an obituary notice of the deceased.

Mr. Dubois offered for the inspection of the Society, two of the golden images lately found in the Indian graves, at Chiriqui, in Central America. Both of them have been assayed at the Mint, and they are reserved as a part of the Mint Cabinet. The one of reptile form is

807 thousandths fine, and its intrinsic value is near thirty-five dollars; the bird is 627 fine, and worth nearly eight dollars.

Some interesting matters of fact may be deduced from these curious relics; which, from the small rings or loops attached to them, and from a consideration of the customs and superstitions of ancient heathen nations all over the world, may be believed to have been worn upon the person both as ornaments and talismans, and as such sacredly deposited with the owners upon their decease. We must assume that these images were manufactured before the Spanish Invasion, and they may belong to a high antiquity.

It appears then, that the ancient Indians were familiar with the mining and metallurgy of gold; and if not very elegant designers, could make quite respectable castings. They also knew the relative values of gold and copper; or they would not have troubled themselves to introduce copper so largely into these sacred emblems or images, and then covering it up with a pickled surface. For it must be observed that copper is not a natural alloy of gold, as silver is; yet we find in one of these specimens a large proportion of copper. And in a considerable quantity of these images, lately melted down at the United States Assay Office in New York, the proportion of the mass was 788 parts gold, 190 parts copper, and only 22 parts silver. Another curious fact is, that they were acquainted with the process of *pickling*, or biting out the alloying metals from the surface, so as to leave a golden exterior. This is specially observable in the reptile specimen; and many years ago, we noticed the same circumstance, in relation to similar images found in the mounds of New Grenada, and shown at the Mint; now in the collection made by the late Jacob G. Morris, Esq. As the ancient artists had no knowledge of the mineral acids, they must have employed certain native salts, such as sal ammoniac and the nitrate of soda, to produce the desired effect.

Central America is a gold-producing region, and formerly we received considerable quantities of gold from that quarter. It was always in artificial laminations, resulting from a process of parting the silver alloy; whence we infer that the gold naturally is considerably alloyed with that metal. The addition of copper is always of man's device; and with a judicious proportion of silver, as jewellers understand very well, a good gold colour is maintained.

The fact that all these images seem to be in the form of reptiles and birds of prey, real or fanciful, leads to the idea that they were meant to propitiate such creatures as were most likely to disturb the repose of the dead.

Mr. Peale presented at the same time for the inspection of the members, another gold image, the surface of which bore no marks of the pickling process, which had been in his possession many years, and may have been obtained from the same localities.

The Annual Report of the Treasurer was read; and that of the Committee of Publication postponed to the next meeting.

Pending nomination No. 394 was read.

The special business of the meeting was then taken up, and the amendments to the laws recommended by the Committee in their report read May 6, 1859, were adopted with some few exceptions, pending the discussion of which the Society was adjourned.

Stated Meeting, December 16, 1859.

Present, thirty-three members.

Dr. Wood, President, in the Chair.

The following donations for the Library were announced:—

Journal of the Franklin Institute. No. 408.—*From the Institute.*
Medical News and Library. No. 204.—*From Blanchard & Lea.*
Journal Boston N. H. S. Vol. VII. No. 1. 1859.—*From the Soc.*
African Repository. Vol. XXXV. No. 12.—*Amer. Col. Society.*
Smithsonian Report for 1858. Sen. Doc.—*Hon. Thos. B. Florence.*
Cat. Library, Mass. Hist. S. Vol. 1, A–L. 8vo.—*From the Soc.*
Boston Pub. Lib. VII. Ann. Report. 1859. 8vo.—*From the Libr.*
Second Supple. to Index. Oct. 20, 1859. p. 8vo.—*From the same.*
Cat. Farmers' High School. Penna. 1859. 8vo.—*From Dr. Pugh.*
Prospectus Phila. and Europe. Steam Ship Co.—*From Cap. Randall.*
Quar. Journal Lond. Chem. Society. No. XLVII.—*From the Soc.*
De turcarum linguæ indole ac natura scripsit F. L. O. Rochrig. Pamp. 30 pp. Philadelphia. 8vo. 1860.—*From the Author.*

The reading of the obituary notice of Mr. Nuttall by Mr. Durand, was postponed to the next meeting.

The report of the Finance Committee was read, and the

appropriations therein recommended for the ensuing year were ordered to be made, viz:

For Journals, . . .	$50
„ Hall, . . .	300
„ Binding, . . .	50
„ Publications, . .	500
„ General Account, .	1800
Total,	$2700

Pending nomination No. 394, and new nominations Nos. 395, 396, were read.

The Annual Report of the Publication Committee, postponed from the last meeting, was read.

The Committee on the sale of the Hall reported the following recommendation, which was adopted:—

Resolved, That the President be requested to prepare and cause to be presented to the Congress of the United States a respectful memorial, in the name of the Society, setting forth the facts connected with the sale of the Hall of the Society to the United States, the action of the Officers of the Government thereon, and the authority given by Congress to sell the Hall as the property of the United States, and requesting the passage of a law directing the acceptance of the conveyance tendered by the Society for said property, and the payment of the purchase money due to it therefore. Signed F. Fraley, Charles B. Trego, Isaac Hays, W. Parker Foulke.

The resignations of Henry A. Boardman and George M. Wharton, members, were again read and accepted.

The deferred special business of the evening being in order, Judge Thompson's amendment to Mr. Fraley's substitute was discussed, and both amendment and substitute adopted.

Amendments to Chapter VII. were then adopted, and the Society adjourned.

Note. The Laws of the Society as amended will be printed immediately, with a list of members, uniformly with the Proceedings, so that those who desire to do so, may bind them in with the current Vol. VII.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. VII. JANUARY—JUNE, 1860. No. 63.

Stated Meeting, January 6, 1860.

Present, fifteen members.

Dr. WOOD, President, in the Chair.

Letters were received from the Elliott Society of Natural History, Charleston, S. C., dated December 15, 1859, acknowledging the receipt of the Proceedings; from the Corporation of Harvard College, dated Cambridge, December 17, 1859, and from the State Historical Society of Wisconsin, dated Madison, December 20, 1859, acknowledging the receipt of the last No. of the Transactions.

Letters were also received from the Dublin University Zoological and Botanical Association, dated Trinity College, Dublin, and from the R. Saxon Society of Sciences, dated Leipsig, August 23 and September 3, 1859, and from the R. Geographical Society, dated London, September 9, 1859, acknowledging donations for the Library.

The following donations for the Library were received:—

Trans. Zool. Soc. London, iv, parts 5, 6. 4to.—*From the Society.*
Proceedings, Nos. 339*, 347*, 384*, 392*.—*From the same.*
Mem. R. Astron. Soc., xxvii. 4to.—*From the Society.*
Monthly Notices, xviii complete, and xx, No. 1.—*From the same.*
Journ. R. Geog. Soc., xxviii. 8vo.—*From the Society.*
Proc. Royal Society, x, Nos. 35, 36.—*From the Society.*
Report (xxviii) British Association. Leeds, 1858.—*From the Ass.*

Ann. Rep. (xxvi) R. Corn. Poly. Soc. Falmouth, 1858.—*From the Society.*

Proc. Liverpool L. and Ph. Soc., No. 13.—*From the Society.*

Journ. London Society of Arts, &c., vii, No. 354–58.—*From the Society.*

Dublin University Zool. and Bot. Ass., i, parts 1, 2. 8vo.—*From the Association.*

Natural History Review or London Quarterly, Vol. i, Vol. ii, 1854, 1855, No. 12, 1856, and, under its new title of N. H. R. and Quarterly Journal of Science, Vol. vi, Nos. 1, 2, 3.—*From Ir. N. H. S.*

Wallace on Geog. Distribution of Birds. (6 pp.) 1859.—*From the Author.*

Jahrb. K. K. Geol. Reichsanstalt, No. 1, 1859.—*From the Institute.*

Berichte, R. Saxon Soc. Leipsig Ph. C., ii. M. P. C., ii, iii.—*From the Society.*

Hankel's Elec. Unters., 4th part. (80 pp. 8vo.)—*From the Author.*

Hofmeister on Phanerogamen, 1st part. (132 pp.)—*From the Author.*

Fechner on Schätzung der Sterngrössen. (70 pp.)—*From the Author.*

Brockhaus on Nala und Damayanti. (30 pp.)—*From the Author.*

Verh. des Ver. Gartenbaues, 1, 2, 3 heften, 1858.—*From the Union.*

Am. Journ. Science. New Haven, Jan., 1860.—*From the Editors.*

Am. Geog. and Stat. Soc. Journal, i, No. 10. New York.—*From the Society.*

Proc. Boston S. N. H., vii, 9, 10, to p. 160.—*From the Society.*

Ann. Rep. Regents N. Y. Univ. March, 1859. (110 pp.)—*From the Regents.*

Proc. Acad. N. S. Philada., Nos. 20, 21, 1859.—*From the Academy.*

Official Army Register for 1860.—*From E. D. Townsend.*

Introductory Lectures and Addresses on Medical Subjects, &c., by G. B. Wood, M.D. Philada., 1859. (460 pp. 8vo.)—*From the Author.*

Map of Eastern Kentucky, showing the western outcrop of the Coal Field, by Joseph Lesley.—*From the Author.*

Mr. Durand, pursuant to appointment, read an obituary notice of Thomas Nuttall.*

The committee to which was referred the paper of Mr. Chase, on English and Sanscrit Analogues, reported in favor

* See page 297.

of its publication in the Proceedings, which was ordered to be done, and the committee was discharged.*

On motion of Professor Lesley, it was ordered that a list of the Corresponding societies with which the Society exchanges publications be published with the Proceedings.

The judges and clerks of the annual election, held this day for officers of the Society, reported that the following named members were elected officers of the Society for the ensuing year:—

President.

George B. Wood.

Vice-Presidents.

John C. Cresson,
Isaac Lea,
George Sharswood.

Secretaries.

Charles B. Trego,
E. Otis Kendall,
John L. Le Conte,
J. P. Lesley.

Members of the Council, for Three Years.

George M. Justice,
George Tucker,
Robert Patterson,
Henry Vethake.

Curators.

Franklin Peale,
Elias Durand,
Joseph Carson.

Treasurer.

Charles B. Trego.

Mr. J. P. Lesley was nominated for Librarian.

* See page 177.

Pending nominations, Nos. 394, 395, 396, were read, and the Society adjourned.

Stated Meeting, January 20, 1860.

Present, twenty-four members.

Dr. GEORGE B. WOOD, President, in the Chair.

Letters were received from the Historical Society of Pennsylvania, dated Philadelphia, January 16, 1860, acknowledging the reception of No. 62 of the Proceedings.

The following donations for the Library were announced:—

Journ. Franklin Inst. for Jan., 1860, No. 409.—*From the Institute.*
African Repository, for Jan., 1860.—*From the Am. Col. Soc.*
Numerical Relations of Elements, by M. Carey Lea. Part 1. (16 pp. 4to.) Philadelphia, 1860.—*From the Author.*

A paper, entitled "Experientiæ præcedentes, by William Sharswood," was presented for publication in the Transactions, and referred to Dr. Bache, Prof. Booth, and Dr. Uhler.

J. P. Lesley was elected Librarian for the ensuing year.

The Standing Committees were appointed, as follows:—

On Finance.—Mr. Fraley, Mr. Justice, Mr. J. F. James.

On Publication.—Dr. Bridges, Mr. T. P. James, Dr. Hartshorne, Prof. Coppeé, Dr. Wister.

On the Hall.—Mr. Peale, Judge King, Prof. Coppeé.

On the Library.—Mr. Ord, Dr. Bell, Dr. Stevens, Dr. Coates, Mr. Foulke.

The list of surviving members was read and corrected. The number on the list on the 1st of January, 1860, was 374

Of whom are resident in the United States, . . 282
And in foreign countries, ... 92

On motion of Judge King, the Secretaries were directed to report to the Society the names of such members as appear to have lost the right of membership.

The Society then proceeded to ballot for candidates for membership.

New nomination, No. 397, was read.

Prof. Trego, Judge King, and Mr. Price were appointed a committee on the subject of a telescope now in the State Library at Harrisburg, reported to be the one ordered for the Transit of Venus in 1769.

All other business having been concluded, the ballot-boxes were opened by the President, and the following named gentlemen declared duly elected members of the Society.

P. Angelo Secchi, Professor of Astronomy at Rome.

Aubrey H. Smith, Attorney-at-Law, of Philadelphia.

Dr. Francis W. Lewis, of Philadelphia.

And the Society was adjourned.

Stated Meeting, February 3, 1860.

Present, nineteen members.

Dr. George B. Wood, President, in the Chair.

A letter was received from Aubrey H. Smith, acknowledging notice of his election.

Letters were received from the Director of the Russian Observatory, dated St. Petersburg, August 30, 1859, from the Royal Danish Society, dated Copenhagen, July 1, 1859, and from the Corporation of Harvard College, dated Cambridge, January 16, 1860, acknowledging copies of the Proceedings.

Letters were received from the Society of Naturalists at Moscow, dated June 13, 1859, from the Director of the Central Observatory, dated St. Petersburg, August 30, 1859, and from the Royal Bavarian Academy, dated München, October 1, 1859, transmitting donations for this Library.

The following donations for the Library were announced:—

Annales des Mines, xv, 1, 2 ls. de 1859.—*From B. des Ponts, &c.*

Bulletin S. Imp. Naturalistes. Moscow. No. 4, 1, 2, 3.—*From the Society.*

Compte-rendu Ph. Cent. Obs. Russia. 1857. 4to.—*From the Directors.*

Annales de l'Obs. 1856. Nos. 1, 2. 4to.—*From the same.*

Oversigt K. Danske V. S. Forhand., 1858. 8vo.—*From the Society.*

Skrifter K. D. V. S. Nat. Afd., iv, 2; v, 1. 1859. 4to.—*From the Society.*

Reports of Council Brit. Meteorological Soc. 6, 7, 8.—*From the Society.*

Glaisher's Determination of Mean Temperatures. 1814 to 1856.—*From the same.*

Glaisher's Mem. on the Metcorology of England. 1858.—*From the same.*

Syro-Egyptian Soc. Correspondence and Papers. 1858 and 1859.—*From the Society.*

Monthly Notices Royal Astron. Soc., xx, No. 2.—*From the Society.*

Airy's Instructions for Mars in 1860.—*From the same.*

Proc. Royal Geograph. Soc., iii, No. 6. 1859.—*From the Society.*

Journ. Soc. Arts and I. in U., vii, Nos. 359–362.—*From the Society.*

Medical News and Library, xviii, No. 205. Jan., 1860.—*From Blanchard & Lea.*

Amer. Journ. Med. Sci., lxxvii. Jan., 1860.—*From the same.*

Report of State Librarian, 1859. Harrisburg.—*From the Librarian.*

Proc. Amer. Antiq. Soc., Oct. 21, 1859. Boston. 8vo.—*From the Society.*

Proc. Acad. N. S. Philada. 1859.—*From the Academy.*

Wilkes on the Circulation of the Oceans. Philada., 1859.—*From the Author.*

Dr. Bache presented a communication from W. Sharswood, asking leave to withdraw his paper offered at the last meeting. His request was granted and the committee discharged.

Alexander (Joseph Addison).—The Rev. Mr. Barnes announced the death of the Rev. J. A. Alexander, of Princeton, N. J., a member of the Society, January 28, 1860, æt. 50.

The Rev. Dr. Leyburn was appointed to prepare an obituary notice of the deceased.

Gilpin (Henry D.)—Judge Sharswood announced the death of the Hon. Henry D. Gilpin, of Philadelphia, a mem-

ber of the Society, January 29, æt. 58. Mr. Joseph R. Ingersoll was appointed to prepare an obituary notice of the deceased.

Espy (James P.)—Dr. Emerson announced the death of Prof. James P. Espy, a member of the Society, at Cincinnati, January 26, 1860, æt. 75. Prof. Henry was appointed to prepare an obituary notice of the deceased.

Jones (Joel).—Mr. Lesley announced the death of Judge Joel Jones, of Philadelphia, a member of the Society, February 2, 1860, æt. 54. Judge Sharswood was appointed to prepare an obituary notice of the deceased.

Dr. Emerson called the attention of the Society to a quality of the diamond as producing light after friction in a dark room. When drawn along, for instance, over the surface of a polished marble mantel-piece, it emits a phosphorescent light. In the case of a large diamond, weighing twenty-four carats, the largest diamond ever found in North America, picked from a bank of drift near Richmond, Va., and now in the possession of Samuel W. Dewey, this phosphoric light was quite vivid and occasional, accompanied with a gentle scintillation. Observations were elicited by this description from Mr. Lesley, Dr. Le Conte, Dr. R. P. Harris, and Dr. Bache. Dr. Emerson referred to a flexible sandstone found in connection with diamonds in Stokes Co., N. C., a hill which is owned by Mr. Dewey.

Prof. Trego exhibited a specimen of this itacolumite sandstone, showing very plainly its flexible and elastic properties.

Pending nomination, No. 397, was read.

The report of the Secretaries, concerning those members elect who appear to have lost the right of membership, was presented and referred to the Committee of Finance.

Dr. Leidy moved that the plaster casts of fossils now in possession of the Society be deposited with the Academy of Natural Sciences of Philadelphia, the consideration of which was postponed for the present.

And the Society was adjourned.

Stated Meeting, February 17, 1860.

Present, seventeen members.

Dr. GEORGE B. WOOD, President, in the Chair.

A letter was read from Dr. F. W. Lewis, acknowledging notice of his election.

A letter was read from Edward Sabine, of London, relative to the decease of Sir Francis Beaufort.

The following donations for the Library were received:—

Trans. Royal Irish Acad., xxiii, part 2. 4to. 1859.—*From the Academy.*

Proc. Royal Irish Acad., vii, parts 1 to 8. 8vo.—*From the same.*

Lloyd's Memoir on Light through Thin Plates. 4to.—*From the same.*

Lloyd's Memoir on Determining the Earth's Magnetic Force. 4to.—*From the same.*

Proc. Boston Soc. N. H., vii, sigs. 11, 12. Jan., 1860.—*From the Society.*

Memoirs Hist. Soc. Penna., vii. (500 pp. 8vo.)—*From the Society.*

Med. News and Library, xviii, No. 206.—*From Blanchard & Lea.*

Journ. Franklin Institute, No. 410.—*From the Institute.*

Ann. Rep. Penna. Inst. Deaf and Dumb. 1859.—*From the Board.*

Ann. Rep. Y. M. Mercantile Library Assoc. Cincinnati, 1859.—*From the Association.*

BEAUFORT (SIR FRANCIS).—Dr. Le Conte announced the death of Sir Francis Beaufort, December 17, 1857, æt. 84.

Mr. Lesley presented a communication from Mr. George Calhoun, of Philadelphia, exhibiting at the same time a model of his compound ventilator, eliciting explanations from Prof. Cresson.

Professor Cresson described the effects of the gale of February 9th and 10th at the City Gas Works, destroying a strong new building, 250 feet long by 57 wide and 54 high, lifting up the roof of iron, braced and stayed in the strongest manner, and weighing with its slates 300,000 pounds, and with it large portions of the walls.

(Continuation on page 292.)

[Read Sept. 17, 1858.]

SANSCRIT AND ENGLISH ANALOGUES.

BY PLINY E. CHASE.

FEW Etymologists will be disposed to claim for their favorite study the dignity of a Science; for neither its elementary principles, its legitimate ends, nor its ethnological uses in verifying history, or determining the pre-historical migrations and affiliations of tribes, are definitely settled. Resemblances, that one investigator regards as valuable and important, are pronounced trivial, accidental, or insignificant by another, whose most serious dicta are, in their turn, made the subject of ridicule by those who advocate a theory of language differing from his own.

Such students as Bopp, Grimm, Curtius, Pott and others, have accumulated a mass of information, from which some rules have been deduced that must be recognized in every attempt to find a scientific basis for comparative philology. But even their labors have been ridiculed by sciolists, who, placing undue stress on the mistakes that are inseparable from all human effort, lose sight of the merit that rewards all sincere investigation. It is not strange that a tyro, perplexed between the assumed derivation of "wig" on the one hand,* and the curious "Ten Paradoxes" of Haldeman on the other,† should be disposed to assert the worthlessness of Etymology, and to regard as its fundamental rule, that "all consonants are mutually interchangeable, and all vowels are of no account," or to set the derivation of "fox" from "rainy day" and "mango" from "King Jeremiah," on a level with the results of the most abstruse philological researches.

But the earnest student will soon outgrow all disposition to ridicule even what may appear to him as absurd in the deductions of careful investigators. He will feel that every addition to knowledge

* Pilus, pelo, peluco, paruik, periwig, wig.

† See Trans. Am. Phil. So. Vol. XI. page 270.

is an addition to the treasury from which future investigators will draw their wealth, and he will rather leave the rejection of the base metal to those who can find a proper use for the good, than attempt to depreciate the whole by directing our attention exclusively to that which he imagines may be bad.

All etymological researches may be arranged in three classes, viz.: 1. Immediate or Derivative; 2. Comparative; 3. Radical or Germinal.

1. Derivative Etymology is limited to the determination of the language from which any given word is immediately derived, and usually without much change of form. Its method is the one adopted by ordinary lexicographers.

2. Comparative Etymology traces similarities and subordinate differences of sound and meaning, between different languages which are generally, though not necessarily, of the same family or origin; and sometimes attempts to assign the cause of such similarity or difference, whether accidental, organic, derivative, or otherwise.

3. Radical or Germinal Etymology, endeavors to ascertain the essential elements of words, without regard to their immediate derivation or remote affinities. The most noteworthy example of this class, is to be found in the labors of the Indian grammarians, who compiled the lists of Sanscrit radicals, an example that might be advantageously imitated by supplying similar lists for other languages.

The philological labors of Oriental scholars, such as Grimm, Bopp, and others, have been mostly comparative. In the sanguine enthusiasm of the early students of Sanscrit, the hope was often indulged, that the key to all languages had been found, and that all dialectic mysteries would be speedily removed. Since these extravagant expectations have been generally given up, there has been, perhaps, an undue tendency in the opposite direction, to disparage the study of Sanscrit for etymologic uses. In contending against such a tendency it is not necessary to assume any theory with regard to the relative antiquity and position of the Sanscrit and its kindred languages; it is sufficient to show that the Sanscrit is one of the earliest known members of the Indo-European family, and that, therefore, from its introduction into a comparative list with any other member of the same family, it is reasonable to hope for aid in ascertaining primitive roots and determining radical significance.

Whatever value may be attached to the following vocabulary must belong to it in virtue of its adaptedness to the wants of the comparative etymologist. It is a list, not of roots, but of analogues;

not of primitive germs from which English words are derived in a line of direct descent, but of similar forms in which similar ideas have been clothed by different members of one human family. It is not to be expected that the points of resemblance should strike all alike, or that all should agree as to the relative value of different portions of the list, but it is proper that the compiler should indicate his own estimate of the comparisons which are merely accidental, as well as of those which he considers most striking. This is done by printing the most important words in small capitals, and using the mark (A.) to indicate what is supposed to be purely accidental.

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SANSCRIT ALPHABET.

NOTE.—The first column contains the letters employed to represent the Sanscrit characters in the following Vocabulary.

Vowels.

a, pronounced like *u* in *but*,* or like *a* in *German*.
a′, " nearly like *a* in *call*,* or in *far*.†
i, " " " *e* in *befal*.
i′, " like *ee* in *meet*.
u, " " *u* in *full*.
u′, " " *u* in *rule*.
ṛ, " " *ri* in *merrily*, (or nearly like smooth *r*.)
ṛ′, " " ṛ lengthened.
ḷṛ " " *li* in *lily* (nearly).
ḷṛ′, " " ḷṛ lengthened.
e, " " *e* in *where*,* or *a* in *amiable*.†
ai, " " *ei* in *height*.
o, " " *o* in *stone*.
au, " " *ou* in *our*.
ṁ a nasal, equivalent to either *m* or *n*. In many words it may be either omitted or inserted, at pleasure.
ḥ, a substitute for a final aspirate or sibilant.

Gutturals.

c, pronounced like *c* in *car*; never like *s*.
ch, " " *c* aspirated, (as in Mac-Henry); never like *ch* in *cheer*.
g, " " *g* in *gun*; never like *j*.
gh, " " *g* aspirated, as in *log-house*.
ṅ, " " *ng* in *King*.

Palatals.

tʃ, pronounced like *ch* in *church*.
tʃh, " " tʃ aspirated.
dʒ, " " *j* in *jail*.
dʒh, " " dʒ aspirated.
n͡, " " the first *n* in *onion* (nearly).

* Wilkins. † Wilson.

Cerebrals.

ṭ, pronounced like *t*, with the tip of the tongue placed far back against
ṭh, the same sound, aspirated. [the palate,* somewhat like *t* in *art.*
ḍ, a cerebral *d*, pronounced nearly like *d* in *drum.* It is sometimes pro-
ḍh, the same sound, aspirated. [nounced like a hard *r* or *l.*
ṇ, pronounced like *n*, with the tongue back (as in *born*).

Dentals.

t, pronounced like Spanish *t*, with the tip of the tongue against the teeth.
th, the same sound, aspirated, nearly as in *hothouse.*
d, pronounced like *d* in day.
dh, the same sound, aspirated.
n, pronounced like *n.*

Labials.

p, pronounced like *p.*
ph, the same sound, aspirated, nearly as in *haphazard.*
b, pronounced like *b.* It is often confounded with the semi-vowel v, "with which some grammarians consider it to be at all times optionally interchangeable."†
bh, the same sound, aspirated, nearly as in *Cobhouse.*
m, pronounced like *m.*

Semi-vowels.

y, pronounced like *y* in *yarn.* In Bengal, it is usually pronounced like *j.*
r, " " trilled *r.*
l, " " *l.*
v, " nearly like German *w.*

Sibilants.

ç, pronounced like *sh* in *shun*,† and interchanges with *k*, *z*, or *h.*‡
ṣ, " " *sh* in *shoe.* Pronounced in some schools like *k'h.*†
s, " " *s.*

Aspirate.

h, pronounced like *h.*

* Wilkins. † Wilson.

‡ "Haec litera orta est e c et respondet graeco ϰ. lat. c, lith *k* et *sz*, Slav. *k* et *s*, hib. *c*, *ch*, et *s*, germ. *h.*"—Bopp.

APPROXIMATE TABLE OF PHONETIC EQUIVALENTS.

SANSCRIT.	GREEK.	LATIN.	GOTHIC.	GERMAN.
a	ă ε o	a e o	a i u	a i u
. . . .	. . . .	i u	ai au	e o
a′	ā η ω	ā ē ō	ē ō	ā (ō) uo
i	ĭ	i	i ai	i e
. . . .	. . . .	e	. . . .	. . . .
i′	ī	i	ei	ī
u	υ short	u	u au	u o
. . . .	. . . .	o	. . . .	. . . .
u′	υ long	u	u	ū
e	αι ει οι	ai ē oi	ai	ei
. . . .	. . . .	ae oe ī ū	. . . .	. . . .
ı ai	ᾳ ῃ ῳ			
o	αυ ευ ου	au o	au iu	ou ō iu io
. . . .	. . . .	u	. . . .	. . . .
au	αυ ηυ	au		
c ch tʃ ç	κ	c q	h (g)	h (g)
g dʒ	γ	g	k	k (ch)
gh h	χ	h g	g	g (k)
t th	τ	t	th (d)	d
d	δ	d	t	z sz
dh	ϑ	f* d b*	d	t
p ph	π	p	f	f v (b)
b	β	b		
bh	φ	f b	b	b (p)
n	γ (nasal.)	n	n	n
n n̤	ν	n	n	n
m	μ ν	m	m	m
r	ρ	r	r	r
l	λ	l	l	l
y	ζ ʿ	j	j	j
s ʃ	σ ʿ	s (r)	s (z)	s (r)
v	digamma	v	v	w

* Occasional.

VOCABULARY.

ABBREVIATIONS.

(A.)—accidental.
ags.—anglosaxon.
ar.—arabic.
arm.—armoric.
caus.—Causative form.
cfr.—(Confer) Compare.
d.—dutch.
dan.—danish.
dor.—Doric.
fr.—french.
frs.—frisian.
g.—german.
goth.—gothic.
ir.—irish.
it.—italian.
lit.—lithuanian.
n.—norse.
nl.—netherlandish.
o.—old.
pers.—persian.
pg.—portuguese.
prakr.—prakrit.
russ.—russian.
s.—Saxon.
sp.—Spanish.
sw.—Swedish.
w.—Welsh.

A, AN. **a, an,** demonstrative radicals; **ec-aʂ,-a′,-a„** one. Cfr. ה the; *ʽη*, Dor. *ʽα*; *ʽεν*; *unus;* goth. *ains;* g. *ein;* fr. *un.*

A-, AN-. **a-,an-,** negative prefixes. Cfr. *ʼα-*, *ʼαν-*, privative; *ʼʼανευ*, [*in-;* goth. *un.*

A-. **a′-,** to. Cfr. *ʼa-* for *ʼʼαμα; ad;* fr. *a.*

Aam. Cfr. אמר to measure, אמה a cubit. v. Measure.

AB-, ABS-. **apa, ava,** from. Cfr. *ʼαπό; ab;* goth. *abu, af;* g. *ab.*

Abacus. **bhacſ,** to devour. Cfr. אבק to struggle, dust; *ἄβαξ.*

Abaddon. **a′badh,** to bind. Cfr. אבר, to destroy, to be cast away.

Abb. **vap,** to weave. Cfr. *ʽυφ-αω;* ags. *wefan;* g. *weben.* [instructor.

Abba, Abbot. **pa′,** to nourish, **pati,** a master. Cf. אב, a father or

Ab-ditory, Ab-domen. **dha′,** to give, to hold, to place; **dha′man,** the body. Cfr. תאה a bound, to establish; טום to close up; *τί-θημι*; *ab-dere,-domen.*

Ability, Able. **balaʂ,** strong. Cfr. בלג to strengthen, אבר strong; *πολύς; habilis, polleo, val-idus;* goth. *abrs;* ags. *abal;* fr. *habile.* v Hab-. [*minor.*

A-bominate. **bha′m,** to be angry or impatient. Cfr. *θυμός*; *abo-*

Abound. **pa¸d,** to heap together; **und,** to wet. Cfr. *abundo.*

ABOUT. **at,** to roam; **ut,** on, up; **pat,** to surround. Cfr. פת a hinge,

Above. v. Over. [אפר he girt about; *ʼεπί; apud;* ags. *abutan.*

ABRIDGE, (abbrevjare.) **rudȷ, avarudȷ,** to break. fr. *abréger.* v.

Abusing. **abhisa¸sana,** abusing. (A.) [Break.

Abyss. **pas,** to embrace; **pus,** to fall. Cfr. *ʼʼαβυσσος.*

Acantha. **ga¸dh,** to torment; **candu′,** to scratch. Cfr. *ʼʼαχανθα;*

Accipiter. v. Eagle. Cip-. [*acanthus.*

Accolade. v. Collar.

Ac-commodate. (A.) **ca′mada**ˢ, giving what is wished. (**ca′ma**ˢ, desire, **da**ˢ, a giver.) Cfr. כמה to long for; *χομίζω*; *commodum*. v. Con-, Mete. [*com-pleo*; fr. *ac-complir*.

Accomplish, **pṛ**, to fill; **pul**, to be heaped up. Cfr. *συμ-πλη-ρόω*;

Ac-cost, Ac-cuse. **cu꞉s**, (**cu꞉sati**,) to speak. v. Coast. Cfr. כסן to reason, to reprove; *causa*, *ac-cuso*.

Ac-coutre. **crṭ**, **caṭ**, to clothe, to surround. Cfr. כתר to enclose; *χιτ-ών*; *cothur-nus*; fr. *accoutrer*. [fr. *as*.

ACE. **ecaˢ**, one. Cfr. אחר one; *εἷς*, *ἕκασ-τος*; *as*; it. *asso*; sp.

Acel-dama. **adȷira**, a court, or yard. Cfr. הקל a field; *ἀγρ-ός*; *agcr*; g. *acker*; goth. *akrs*; ags. *æcer*.

Acerbity. **crb**, **frbh**, to hurt or injure. Cfr. שרף to burn, חרב a sharp instrument; *σέρφος*; *accrbus*.

Acetous, Acid. **a**, privative? v. Sweet. *acetum*, *acidus*.

ACHE. **acaˢ**, pain, sin; **a꞉has**, sin. Cfr. אנה grief, affliction; *ἄχος*, *ἄγχος*; *angor*; ags. *ace*.

Achieve. **tfi′v**, to take, to cover. Cfr. חפה to cover; *κάπω*; *capio*.

ACHOR. **cfar**, to ooze, to trickle; **tfar**, to go. Cfr. קור an issue, to gush out; *ἀχώρ*, *χωρέω*, *ἰχώρ*.

Acker. **ac**, to wind, or move tortuously.

Acne. **a꞉ca**, a mark or spot.

Acolyte. **acula**, of low family. Cfr. *ἀκόλουθος*.

Acop. v. Cap.

Acquaint. v. Know. Cfr. goth. *kunnan*; g. *kunde*; ofr. *accointer*.

Acre. v. Acel-dama.

Acrid, Acritude. **chard**, to bite; **crṭ**, to cut; **cṛ′**, to hurt or injure; **agriˢ**, the edge of a sword. Cfr. כרת, קרץ to cut off or down; *accr*, *acritudo*. [end; *ἀκρο-πο-λις*; *acro-terium*.

ACRO-POLIS. **agra**, the summit; **palli′**, a village. Cfr. אחר the

ACT. **a꞉c**, **adȷ**, to go. Cfr. *ἄγω*, *ἠγέομαι*; *ago*, *act-um*; fr. *agir*.

ACUTE. **cutṭ**, to cut. Cfr. *κόπτω*; *a-cutus*.

AD-. (af-, ag-, &c.) **a′**, to; **ath**, **ad**, to go; **adhi**, over. Cfr. את with; אצל at; *εἰς*; goth. *at*; og. *az*; ags. *æt*, *to*; g. *zu*.

A-damant. v. Dam.

Adays. **adya**, to-day. Cfr. *ἤδη*; *hodie*; g. *heute*; fr. aujour-*dhui*.

ADD, And. **add**, to connect; **da′**, to give. Cfr. את with; *ἔτι*, *τέ*, *δέ*; *ad-do*, *et*; g. *und*; d. *en*, *ende*.

Adder. **ad**, to eat; **dhu′r**, to strike, to kill; **nat**, **nud**, to hurt or kill. Cfr. אר torment; חרר to penetrate; *ἔδω*, *ἐχ-ιδ-να*; *edo*, *natrix*; goth. *nadrs*; g. *natter*; ags. *aetter*. [Dress.

Ad-dress. **tra꞉s**, to speak. Cfr. דרש to inquire; fr. *ad-dresser*. v.

Adeling. **id**, to praise; **al**, to be competent. Cfr. ags. *ethel*; g. *edel*; sp. *hidalgo*. v. -Olescent.

Adept. *adipiscor, ad-eptus*. v. Apt.

A-dieu. it. *addio*. v. Divine.

Adipose. **dap**, to accumulate. Cfr. טפש fat; *λίπος*; *a-deps*.

Adjutant. v. Aid.

Ado. **ad**, to strive, or endeavor. Cfr. אר trouble. [*'αιδώς*; *adoro*.

Adore. **dr**, to reverence. **a′daraς**, respect. Cfr. הדר to honor;

Adroit. v. Dress. [it. *avviso*.

Advice. **a′vis**, evident. Cfr. *φάσ-μα*; *visus*; fr. *avis*; sp. *aviso*;

Aegi-s,-lops. **adʒaς**, a he-goat. Cfr. אקו a wild-goat; *ʼαιξ*.

Ael-, Aelf-, Al-, &c. **al**, to be competent; **a′laς**, large, extensive. Cfr. אול strength, אל a leader; *ʼολος*; *ʼαλδω*; *al-tus*; ags. *eald, ald-er*; g. *helfen*. [goth. *aivs*.

Aeon. **a′yu**, age; **evaς**, going, moving. Cfr. *αἰών*, *'αεί*; *aevum*;

Aerate. **i′r**, **av**, to go, to shake; **harις**, air, wind; **va′**, to breathe,

Aest-. v. Ash. [to blow. Cfr. יאר a river; *'αήρ*; *aura*. v. Wind.

Aft-er. (ab-) **apa**, a particle of separation, &c.; **tar**, suffix of the comparative degree. Cfr. *ʼαπο*, *'επί*, *'οπίσω*; *ab, ubi*; goth. *af, afar, aftaro*; g. *after*; d. *æchter*.

Aga. **a′**, intensive, **dʒi**, to conquer. v. Act.

Again-st. **can, gam, ga′**, to go or approach; **ghuṇ**, to turn round; **aṅga„**, again. Cfr. ags. *on-gean, agen*; g. *gegen, gegangen*.

Agapè. **gup**, to guard or protect. Cfr. *'αγαπη*; *cupio*. [*'αχάτης*.

Agate. **cu„d**, to burn; **tʃa„d**, to shine. Cfr. כר sparks, an agate;

Age. **yuga„**, an age. Cfr. fr. *age*. v. Aeon.

Ag-ent,-ile,-itate. v. Act. [אגר a troop; *ʼαγημα*; *agmen*.

Agminal. **ag**, to move, to approach; **man**, participial ending. Cfr.

Agnes. **agniς**, fire. Cfr. *ignis*; sp. *Iñez*.

Agog. **cac**, to be thirsty; **ca′„cʃ**, to desire. Cfr. קוה to hope, to expect; it. *agognare*; fr. *à gogo*.

Agon-ism,-y. **a„gh**, to go swiftly, to begin; **agha„**, pain. Cfr. *'αγών-ισμα*; *'αγωνία*; *angor*; g. *angst*. v. Act.

Agr-arian,-estic,-iculture. v. Acel-dama. [v. Grat-, Cord-.

Agree. **crath**, to amuse. Cfr. sp. pg. *agradar*; fr. *a gré, agréer*.

Agrise. **ghur**, to terrify. ags. *agrisan*.

Ague. **edʒ**, to tremble. v. Ache. [fr. *ah*.

Ah. **a**, an interjection of pity. Cfr. אח alas; *ʼα, αἴ*; *ah*; g. *ach*;

Aha. **aha**, an interjection of ascertainment, commendation, &c. Cfr.

Ahoy. **hve**, to call, to challenge. [אח; *'αά*; *aha*.

Aid. **ad**, to strive; **yat**, to persevere, to work; **yuta**, joined. Cfr. *adjuto;* it. *aiutare;* fr. *aider, ajouter.* [*va-cillo;* ags. *eglian.*

Ail. **cel, tſal**, to shake, to totter. Cfr. חלך weak, afflicted; *'αγλίη;*

Air. v. Aer-ate. A-jutage. v. Aid.

Aisle, Al-ar,-ate. **il**, to go. Cfr. *ala;* fr. *aile.* [*'εγείρω;* *alacer.*

Alacrity. **al**, to be able; **a′cr**, to animate, to spur on. Cfr. הכר strong;

Alas. **lut**, to grieve. Cfr. g. *leid;* d. *leed, laas, helaas;* ags. *lath;* fr. *helas.* [the face and eyes; *χολός;* *cholera, color.*

Al-cohol. (Ar. *al-kahala.*) **ca′la**, of a dark color. Cfr. כחל to paint

Alder-man. v. Ael-.

Alexi-. **racſ**, to defend. Cfr. *'αλέξω.*

Algid. v. Gelid. [*alis.* v. Alter, Ulter-.

Alias, Alien. **anyaˢ**, other. Cfr. הלא yonder; *'αλλως;* *alias;* goth.

All. **achilaˢ**, all, entire. Cfr. כל all; *ullus, solidus;* goth. *alls;* g.

Allah. אל God. v. Ael-, All. [*all;* ags. *eall.* v. Ael-

Alle-gory. **ghur**, to sound, to inquire. Cfr. חקר to investigate; *'αγορεύω, 'αλληγορία.* [*'αλάομαι;* *amb-ulo;* fr. *aller, allée.*

Alley. **il**, to go; **a′valiˢ**, a row, a range. Cfr. הלך way, journey;

All-odial. **ad**, to occupy or possess. Cfr. *'ιδιος;* g. *od-zins;* fr.

Allonge. v. Lunge. [*alleu;* it. *allodio.*

Allow. **la′**, to give. fr. *allouer.*

Almoner, Alms. **ma,h**, to give; **mas**, to measure. Cfr. *'ελεημοσυνη;* it. *limosina;* g. *almosen;* d. *aalmoes;* fr. *aûmone;* ags. *aelmes.*

Alone, Aloof, Also. v. All, One, Off, So.

Altar. **ala′ta,,** a firebrand; a coal, burning or extinguished. Cfr. עלה a burnt offering; ארה an altar; *altare, ara;* g. *altar.*

Alter-nate. **antaraˢ, itaraˢ**, other. Cfr. אנת thou, a person; *"ετερος;* *alter;* goth. *anthar;* g. *ander, ändern;* ags. *odher;* fr. *autre, alterer.*

Alv-eary,-ine. **ulva,,** the womb, a cavity. Cfr. *δελφύς;* *alvus, vulva.*

Ama. v. Aam. [*μάω;* *amo;* fr. *aimer.*

Am-ability,-atory. **cam**, to love. Cfr. כמה to long for; חמד beloved;

Am-, Amb-, Ambe, Ambi-. **am, amb**, to go. **abhi**, a particle implying proximity, superiority, &c. Cfr. *'αμφί; "αμβη;* *am-, amb-;* g. *um-;* d. *om-;* ags. *emb-, ymb-.*

Amalgam. (*μάλαγμα.*) **mil**, to mix.

Amaranth. **a**, privative; **mr**, to die; **marana**, death. Cfr. מרץ disease; *μαραίνω, 'α-μάραντος;* *amaranthus.*

Amaurosis. *'αμαυρός.* **mur**, to wrap round; **mr**, to die.

Ambassador. **paç, paſ, pas, pat**, to go; **bhaſ**, to speak. Cfr. פכח to

go by, *ἄμβασις*; goth. *andbahts*; ags. *embeht*; it. *ambasciadore*; sp. pg. *embaxador*; fr. *embassadeur*.

Amber. **amb**, to go; **ambara**ı, a perfume.

AMBI-. **ubhau**, both. Cfr. *ἀμφω*; *ambo*. v. Am-.

Amble, Ambulatory. v. Alley.

Amen. **mun**, to promise; **man**, to think; **om**, verily. אמן

A-methyst. **mad**, to intoxicate; **madhu**, spirituous liquor. Cfr. *μεθύω*, *ἀ-μέθυστος*.

AMI-able,-cable, Amorous. v. Am-ability. [

Amict. **mac**, to adorn. *amicior*.

AMPHI-. v. Amb-, Ambi-. [*ῥόω*; *amplus*; fr. *ample*. v. Fill.

Ample. **uıbh**, to fill; **pul**, to be great. Cfr. אמב an assembly; *πλη-*

Amputate. **pat**, to cut, to divide. Cfr. פוץ, to scatter, to break to pieces; *κό-πτω*; *amputo*.

Amylaceous. (*a-μυλον*, *amylum*.) v. Mill.

An. v. A.

Anchor. **aıc**, **vanc**, to move crookedly; **aıg**, to divide; **ancuraˢ**, a shoot or sprout. Cfr. חכה a fish-hook; *ἀγκή*, *ἄγκυρα*; *anchora*; g. d. *anker*; sp. *ancla*; it. pg. *ancora*; fr. *ancre*.

Anchoret. **anagaʹraˢ**, a hermit (**an**, privative), **agaʹraı**, a house. Cfr. אגר a tower, an altar; קרה a roof, a city; *χώρα*, *ἀνα-χωρέω*,

Ancient. fr. *ancien*; it. *anzi*, *anziano*. v. Ante, Antic. [*ἀνα-χωρητής*.

Ancillary. **ǧiʹl**, to do, to worship. *ancillaris*.

An-con,-cone. (*ἀγκών*.) **ancaı**, the flank; **angaı**, a limb or member.

AND. v. Add. [v. Angle.

And-iron. **indh**, to kindle, to shine. [*ἀνήρ*; *γυνή*.

ANDRO-GYNOUS. **naraˢ**, man; **dǰaniʹ**, woman. Cfr. אכש man;

ANEMO-. **an**, to sound, to breathe, to go. Cfr. אנף to blow, or snuff with the nostrils; *ἄνεμος*; *animus*. [*ἄγγελος*. v. Call.

An-gel. **cel**, **tʃel**, to go; **aıtʃ**, to move, to speak. Cfr. לאך an angel;

Anger, Angina, Angor. **aıgh**, to go, to blame or censure; **aghaı**, passion; **ugraı**, anger. Cfr. אנק to cry out; חנק to strangle; *ἄγχω*, *ἄγγρις*, *ὀργή*; *angor*; goth. *aggvus*; g. *eng*; d. *ang*.

ANGLE. **aıg**, **aıgh**, to go; **aıtʃ**, to bend; **angaˢ**, near, proximate; **aıgulaˢ**, a finger. Cfr. *ἐγγύς*, *ἀγκύλος*, *ὄγκος*; *angulus*, *uncus*; g. *winkel*; d. g. *angel*. v. Anchor; Ankle.

Anguish, Angust. fr. *angoisse*. v. Anger. (**angadǰaˢ**, sickness.)

Anhel-ation. **anila**, air or wind. Cfr. *anhelo*. v. Anemo-.

ANIL. **niʹlaˢ**, blue. Cfr. *nilion?* sp. *añil*; pg. *anil*.

ANIM-al, &c. v. Anemo-.

An-kle. **aʹn̈-cal**, to bind or tie. Cfr. *χηλή*; g. *änkel*; d. *enkel*; ags. *ancleov*; קלט contracted, drawn together. v. Angle, Keel.

Anneal. **nal**, to shine, to bind or confine; **ul**, to burn. Cfr. ags. *an-œl-*.

Ann-als,-ual. **hay**, to move; **hayanas**, a year. Cfr. ϝένος; *annus*.

An-odyne. **tun̤**, to curve, to bend or make crooked. Cfr. ὀδύνη.

An-orexy. **rac**, to taste, to obtain. Cfr. רכש to obtain; ὄρεγω.

Ansated. **a,s**, to share, to divide; **a,sas**, a portion, a shoulder. Cfr.

Anser. v. Goose. [*ansa*.

Answer. **anusa´rin̤**, following; **anusva´ras**, echo; **anu**, after; **svṛ**, to sing, to praise; **svar**, to sound, to reprove. Cfr. צרח to cry out; שור to sing, to praise; συρίζω; ags. *andswarian*; v. Swear.

Ante-, Anti-. **antas**, final, near, a boundary; **anti**, near. Cfr. את?

Antelope. **enas**, an antelope. [with; ἀντί; *ante*.

An-tennæ. v. Tend.

Anthem. **am**, to sound; (**i´ḍ**, to praise, to celebrate;) Cfr. הום, המה, a noise; ϝύμνος, ϝύδω.

An-tie,-tique. **tac**, to laugh at; **tic**, to go, to move; **antagas**, dead, departed. 'Cfr. *antiquus;* fr. *antique*. [v. Ante.

Antre. **antar**, within; **antara**,, a hole or rent. Cfr. ϝάντρον; *antrum*.

An-vil. **vil**, to break or divide, to throw, to direct or send. Cfr. בלק, to break; βάλλω; *pello*. [Ache.

Anxious. **ca´ncſ**, **ma´ncſ**, **va´ncſ**, to desire. Cfr. *anxius*. v. Anger,

Any. **anyas**, other. Cfr. *ullus*; ags. *anig*; g. *einig;* d. *eenig*. v.

Aorist, Aorta. **ṛ**, to go. [An, One.

Ap-, Apo-. v. Ab-.

Ape. **capis**, an ape. Cfr. קוף an ape; g. *affe;* d. *aap;* ags. *apa*.

Aper-. v. Over.

Apheresis. **hṛ**, to seize. Cfr. αἱρέω.

Apiary. **bhas**, a bee. Cfr. *apis;* ags. *beo;* sp. *abeja;* d. *bij*.

Apollyon. **lu´**, to cut. Cfr. ὀλλύω, Ἀπολλύων.

A-pory. **pa´ṛ**, to get through or over; **pur**, to go before. Cfr. ϝά-πορος.

Apo-siopesis. **svap**, to sleep. Cfr. σιωπάω.

Apo-stle. v. Stall.

Apo-theca-ry. **dha´**, to place. Cfr. ἀπο-θήκη;

Apo-zem. **ǥai**, to boil. Cfr. ζέω.

Ap-paratus, Apparel, Apparitor. **pṛ**, to complete, **pari**, ornament. Cfr. פאר to adorn; *ap-paro*.

Ap-parent,-pear. **pur**, to go before. Cfr. *ap-parco*.

Appeasing. (A.) **upaǥa´ntis**, appeasing. v. Peace. [ags. *appel*.

Apple. **ap**, water; **pu´l**, to accumulate. Cfr. goth. *apel;* g. *apfel;*

Apricate. **bhra´ǥ**, to shine. Cfr. ברק a flash; βράσμα; *apricor*.

A-pron. **pra**, forth. v. Front.

Apt. (Ad-apt.) **a′p**, to obtain; **a′pta**ʂ, fit. Cfr. כפך to gather, to apply; קבא to join, to cling together; ᾽απτω; *aptus.*

A-ptera. **pat̤**, to go, to move; **vi-pat̤**, to fly. Cfr. ᾽α-πτερος.

Aqua. **ap**, water; **ucſ**, to moisten. Cfr. אפק a river; χέω, ποταμός; *aqua;* goth. *ahva.*

Arc, Arcanum, Arch, Archaism, Archives, Archon, Arctation. **artſ?** to honor, to reverence; **rakſ**, to guard, to preserve; **arh**, to be worthy, to be powerful. Cfr. ראש principal, to lead; ᾽αρχω, ᾽αρχέω; *arx, arca, arcus;* goth. *arka;* ags. *arc.*

Arctic. **rcſa**ʂ, a bear. Cfr. ᾽αρκτος; *ursus;* fr. *ours.*

-Ard. **arthas**, thing, kind, sort. v. Art.

Ardent, Arduous. **ard**, to pain; **u′rddhva**ʂ, high; **ardani**ʂ, fire. Cfr. ᾽αρδην; *ardeo; arduus.* v. Ash.

Area, Areole. **ra̤g, r̤**, to go. Cfr. ארח a road; ערג a small floor or yard; ῾ρέω; *area.*

Arena. **iraṇa**ʂ, salt or barren soil, desert. Cfr. ᾽ερημος; *arena.*

Argent. **radʃata**ʂ, silver, white. Cfr. חרצ gold; ᾽αργυρος; *argentum.*

Argil. **rtſtfh**, to become hard or stiff; **rdʃ**, to be firm; **radʃata**ʂ, white. Cfr. רג a clod, חור white; ᾽αργής, ᾽αργιλος, ῾ρίγος; *argilla.*

Argue. **rag**, to doubt; **ra̤gh, la̤gh**, to speak. Cfr. λογίζομαι; *arguo.*

Aristo-cracy. **varifta**ʂ, best. Cfr. ᾽αριστος.

Arm. **r̤, kram**, to go, to move; **varmma**, armor. Cfr. רמה to throw; ῾αρμός; *armus, ramus;* ags. g. d. *arm.*

Aroma. **rama**ʂ, pleasing, charming. Cfr. ᾽αρωμα.

Arrant. **r̤**, to go. Cfr. *errans;* fr. *errant.* v. Area.

Array. v. Dress, Read-. [fr. *arreter.*

Arrest, Arret. **rut**, to resist or oppose. Cfr. *resto?* it. *arrestare;*

Arrow. **r̤, ves, va′, sr̤**, to go; **sara**ʂ, an arrow. Cfr. שרה to loosen, dismiss, send forth; כרח to shoot forth, to spread; σείω; *sagitta;* goth. *arhvasna;* ags. *arve, arewa.*

Arsenal. **racſ**, to protect, to preserve; **nau**ʂ, a boat. *arx navalis?*

Arson. v. Ardent, Ash.

Art. **artha**ʂ, intelligent; **kr̤**, to do; **karttr̤**, an agent, a maker. Cfr. חרצ active, industrious; κράτος; *ars;* g. *art.*

Arthritic, Article, Articulate. **dhr̤**, to hold; **r̤t**, to go; **artha**ʂ, thing. Cfr. ᾽αρθρον, ᾽αρθρῖτις; *artus, articulus.*

Arundinaceous. **ratha**ʂ, ratan. Cfr. *arundo.*

Aruspice. **ara**ʂ, swift; **r̤**, to go; **spaɢ**, to inform, to touch, to make evident; **spaɢa**ʂ, a spy. Cfr. *aruspex, specio, ar-mentum?*

Arvel. **arv**, to kill.

As. v. All, Same. **al-sam**, **sa**, (in composition,) with, like; **yat**,

Asa-fœtida. v. Resin. [as. Cfr. ᾿ως; g. d. *als*; fr. *aussi*.

Ashes. **indh**, to kindle; **ush**, to burn. Cfr. אש fire; עשת to shine; ᾽*αζω*, ᾽*αίθω*; *asso, uro, ustus, æstus*; goth. *azgo*; ags. *ad, aske*; sp. pg. *ascua*; g. *asche*.

Ask. **va′ˌcſ**, **va′ˌtſh**, to desire. Cfr. ᾽*αξιόω*; ags. *acsian*; g. *heischen, wünschen*; d. *eischen*; fr. *exiger*. v. Wish. [*aspergo*.

Asperse. **sprg**, to bathe, to besprinkle. Cfr. פרש to scatter; *βρέχω*;

Askant, Askew, Asquint. **skaˌd**, **sku**, to go, to move; **skabh**, to be dull or stupid. Cfr. g. *schief*; d. *scheef, schuif, schuin*; שנה to wander; *σκαιός*. [sp. pg. *asno*; fr. *ane*, (*asne*.)

Ass. **agvaˢ**, a horse. Cfr. *asinus*; goth. *asilus*; g. *esel*; ags. *asal*;

Assart. **grath**, to loosen. Cfr. שרט to cut; *solutus*; fr. *assarter*.

Assation. v. Ash.

Assay. v. Seek.

Assemble. **sam**, together, with; **puˈl**, to collect; **samb**, to collect.

Asseverate. v. Swear. [Cfr. *συμβάλλω*; it. *assamblea*; fr. *assemblée*.

Aster. v. Star. [Cfr. ᾽*ατμός*, ᾽*ασθμα*. v. Wind.

Asthma. **as**, to move, to throw; **dhma′**, to blow, **a′tman**, wind, air.

Astonish, Astound. **stan**, to thunder, to groan. Cfr. *στένω*; *attono*;

Astrolabe. v. Star, Lab-. [fr. *estonner*.

Asylum. **a′gayaˢ**, an asylum, an abode or retreat. Cfr. ᾽*ασυλον*.

At. **at**, to approach; **atra**, here; **adhi**, **ut**, above, upon. Cfr. את with; אתה to approach; ᾽*ετι*; *ad*; goth. *at*; ags. *æt*.

Atlas, Atlantic. **atalaˢ**, immovable.

Atmosphere. v. Asthma, Sphere.

Attach, Attack. **tic**, to assault, to attack. Cfr. תכה to join; *τάζω*; *tactus*; fr. *attacher, attaquer*.

Attic. **attaˢ**, an attic; **att**, to surpass or excel.

Attitude. **adj**, to go, to drive away. v. Act. Cfr. *actus*; sp. *actitude*;

Attorney. v. Turn. [fr. *attitude*.

Auburn. v. Brown. [g. *wachsen*. v. Eke.

Auction. **vacſ**, to increase; **vatſ**, to speak. Cfr. *αυξέω*; *auctio*;

Audacious. **dacſ**, to expedite, to hurt or kill. Cfr. טקס to set in order; *δεξιός*; *audax*; fr. *audacieux*.

Audible. **av**, to hear. Cfr. אזן an ear; ᾽*αίω*, ᾽*οῦς*; *audibilis, auris*; fr. *oüir*; goth. *auso*; g. *ohr*. [ags. *nafegar*.

Auger. **chur**, to cut; **djiri**, to wound, or injure. Cfr. גרר to cut;

Augment. v. Auction.

August. (*augustus*.) **odjas**, might, splendor.

AULIC. **a′layaʂ**, a dwelling. Cfr. *'αυλή*.

Aura. v. Aerate.

Auriga. **av**, to go; **racſ**, to direct. Cfr. ראש to lead; *'ράγα*; *rego*

Aur-ist, Aus-cultation. v. Audible.

Aurora. **aruṇaʂ**, the sun, dark red; **ṛ**, to go. Cfr. אור light; *αὔω*?

Aurum. v. Gold. [*αὔριον*? *aurora*. v. East.

Auspice. **av**, to go; **viʂ**, a bird. v. Aruspice. Cfr. *αὔω*, *οἰωνός*; *avis*.

Austere. **sthiraʂ**, firm, steady. Cfr. שות to set; *αὐστηρός*.

Author. v. Auction. Cfr. *auctor*; fr. *auteur*.

Auto-chthon. **adas**, this, that; **cſoṇi**, the earth. Cfr. *αὐτόχθον*.

Autumn. **tam**, to be disturbed; **tamas**, darkness, gloom. Cfr. טמע

Auxetic, Auxiliary. v. Auction. [hidden, sunset; *autumnus*.

AVALANCHE. **ava-luˌtſ**, to pluck up, to separate; **ava-luṇthana**, rolling on the ground; **aˌtſ**, to go. Cfr. לקח to carry away. v. Vale.

Avarice. **vṛ**, **vṛt**, to choose; **vṛdh**, to increase; **av**, to desire. Cfr. [אוה to desire; *aveo*, *avaritia*.

AVATAR. **ava-tṛ′**, to descend; **tṛ′**, to pass over. Cfr. *trans*.

Avaunt. **va′t**, to go. Cfr. כתר, כבר, to separate; *βαίνω*; *ibant*.

Average. v. Abridge.

Aviary. v. Auspice.

Avidity. v. Avarice.

Away. **ava**, from. v. Way. [ir. *agh*.

Awe. **atſ**, to worship. Cfr. אים fear; *'αγάω*; goth. *agis*; ags. *egesa*;

Awk. **ac**, to go crookedly.

Axe. **tacſ**, to hew; **ag̣ri**, an edge. Cfr. חצב to cut; חצן an axe;

Axiom. v. Ask. [*'αχή*, *'αξίνη*; *ascia*, *acies*; g. *axt*; ags. *æx*, *æse*.

Axis, Axle. **ag̣u**, to pervade; **acſaʂ**, part of a car. Cfr. אשר an axis; *ϝαξων*; *axis*; g. *achse*; fr. *axe*; ags. *æx*.

Aye. **ghuſ**, **aˌh**, to speak, to affirm. Cfr. את to consent; *γέ*; *jam*, *ajo*, *immo*; goth. g. d. *ja*; ags. *ja*, *gyse*, *gea*; fr. *oui*.

Aye. v. Aeon.

Bacca. **bhacſ**, to eat. Cfr. נכא a mulberry tree; *φαχή*; *φάγω*.

BACK. **bhudʒ**, to bend; **bhugnaʂ**, crooked. Cfr. w. *bog*, a swell; ir. *boc*, to swell; goth. *biugan*, *ibuks*; ags. *bugan*, *beogan*, *bog*; g. *beugen*.

Bad. **ba′dh**, to oppose, to annoy. Cfr. אבר to perish, or destroy.

Badge. **patſ**, to make evident, to represent. **bhadʒ**, to serve, to

BADINAGE. v. Banter. [share out. Cfr. בחן to discern, a beacon.

Bag. **pag̣**, **paſ**, to bind, to tie. Cfr. *πήγω*; *pango*, *pactus*; fr. *poche*, *bagage*; g. sw. *pack*; d. *pak*. v. Back.

Bagnio, Baigne, Bain, Bane. v. Bath. [ags. *beorn.*

Bairn. **bhṛ**, to carry, to nourish. Cfr. *φέρειν*; *fero*; goth. *bairan*;

Bake. **patʃ**, to cook; **bhaktaˢ**, (**bhadʒ**,) cooked. Cfr. *φώγω*, *πέσσω*; *pistor*; g. *backen*; d. *bakken*; ags. *bacan.*

Bale. **puˊl**, to collect. Cfr. חבל to bind; *πάλλα*; g. *ballen*; d. *baal*; fr. *balle.* [to cut, to strike through; *βάλλω*;

Bale. **bal**, to strike, to kill. Cfr. אבל to lay waste, to mourn; פלח

Balister, Ball, Ballad, Ballet, Ballatry, Boll, Balloon, Ballot. **bhal**, to throw up; **pal**, to go; **pil**, to throw; **puˊl**, to collect. Cfr. פלא to put away; *βάλλω*, *πάλλω*, *πάλλα*; *pila*, *ful-men*; g. *ball*; d. *bal*; fr. *balle*, *ballon*, *boule*, *bal*, *ballet*, *baladin*, *ballade*;

Balk. **valg**, to leap. [it. *palla*, *ballare*, *ballata*, *balletto.*

Balm, Balsam. **bal**, to live, to nourish **balaˢ**, robust. Cfr. *βάλ-*

Balneal. v. Bath. [*σαμον*; fr. *baume.* v. Ability.

Baluster. **phull**, to bud or blossom. Cfr. *βαλαύστιον*; it. *balaustro*; fr. *balustre.*

Ban, Bandit, Bane. **ban**, to injure, to sound; **pen**, **pain**, to go; **bhan**, to speak. Cfr. בן to divide or separate; *φενω*, *βαίνω*; *venenum*; it. *bando*; fr. *ban*; g. d. *bannen*; ags. *bana.* v. Funeral.

Band, Bandage, Bandana. **bandh**, **badh**, to bind or tie; **bandhanaˢ**, a ligature. Cfr. פנר a girdle; *βαίνω*; *pando*; sp. pg. it. *banda*; goth. *bandi*, *bindan*; ags. *banda*, *bindan*, *bendan*; fr. *bander.* v. Federal.

Bang. **bha,dʒ** (**bha,ga**), to break. Cfr. בג a fragment; בג to divide; פנץ to break in pieces; בקע to cleave; g. *bängel.* [fr. *banque.*

Bank. **banh**, **ma,tf**, to increase. Cfr. *ὀγκόω*; g. d. *bank*; it. *banco*;

Banner. **pen**, **pain**, **phan**, **ven**, to go; **pannaˢ**, downward motion. Cfr. *πῆνος*; *pannus*; g. *fahne*, *panier*; goth. *bandva*, *fana*; sp. *bandera*; fr. *banniere.* v. Ban.

Banter. **bhad**, **bhand**, to jest. Cfr. בעט to spurn.

Baptize. **baˊd**, to bathe; **va**, water, **pat**, to distribute. Cfr. *βαπτίζω.*

Bar. **prˊ**, **spr**, to protect. Cfr. ערב, ברח a bar; *mora*; sp. pg. it. *barra*; fr. *barre*; g. *sperren.*

Barb, Barbarian. **barb**, to go; **vr**, to cover; **bharbh**, to injure; **varvaraˢ**, a barbarian, woolly hair; **barbaraˢ**, a blockhead. Cfr. *βάρβαρος*; פרא a wild man; *barba*; goth. *bars.*

Bard. **prd**, **mrd**, to delight, to make happy.

Bargain. **argh**, to cost, to be worth; **pr**, to transact business. Cfr. *περάω*, *πρίω*; it. *barganare*; fr. *barguigner.*

Barge, Bark, Barque. **bhṛ**, to carry; **rdȷ**, to go. Cfr. *βάρις*; *pergo*; d. *bargie*, *bark*; g. *barke*; fr. *barque*; sp. it. *barca*.

Bark. **vṛ**, **val**, **barh**, to cover; **valc**, bark. Cfr. *φελλός*; g. *borke*; dan. *bark*.

Bark. **bukk**, to bark, to speak; **barh**, to speak. Cfr. נבח to bark; [*βαύζω*; *bucca*.

Barley. **pi´**, **pa´**, to drink, to nourish. Cfr. בר corn; *πυρός*; *far*; goth. *barizeins*; ags. *bere*. [*ferm-entum*; ags. *beorm*.

Barm. **bhṛ´**, to fry; **gharmaˢ**, heat. Cfr. בער to burn; *θέρμα*;

Barn. **pṛn**, to fill; **u´rnu**, to cover. Cfr. *plenus*, *urna*; ags. *œrn*. v. Barley.

Baro-, Baryta. **uru**, **bhu´ri**, much; **bhṛ**, to bear. Cfr. ברא fat; *βάρος*.

Baron. **bharuˢ**, a husband, a lord. Cfr. בר a son; *vir*; sp. *varon*;

Barouche. (A.) **mrutſ**, to go. [it. *barone*; ags. *wer*.

Barrack. sp. *barraca*; fr. *baraque*. v. Borough.

Barrow. ags. *berewe*. v. Bear.

Barrow. **vṛh**, to grow or increase, to erect. Cfr. ברא fat; goth. *bairgahei*; ags. *beorg*; g. *bergen*, *berg*.

Base. **pat**, to go, to fall. Cfr. פצר a pit; *βάθος*, *βάσις*; g. *boden*; d. *bodem*; it. *basso*; sp. *baxo*; fr. *bas*.

Bash-ful, (a-bash.) **bheſ**, to fear. Cfr. בוש, בש shame.

Bashaw. **patiˢ**, a master; **ſa**, best, excellent. Cfr. פחה a governor; *πότ-νια*; *δεσ-πότ-ης*; *pot-ens*; *padi-shah*.

Basil-ic,-isk. **patiˢ**, a master; **ǧi´l**, to adore. Cfr. *βασιλεύς*.

Basis, Bass, Basso. v. Base.

Basket. **paǧ**, to knot or tie; **ci´ṭ**, to bind.

Bastard. **bust**, to disregard. Cfr. בזה a vile, mean person; g. fr. *bastard*; d. *bastaard*; it. sp. *bastardo*.

Baste, Bastinado. **vast**, to hurt or kill. Cfr. פשט, בז to invade, to spoil; *vasto*; it. *bastone*; fr. *baton*. v. Beat.

Bat, Bate, Batter, Battle. v. Beat.

Batch. g. *baksel*. v. Bake.

Bateau. v. Boat. [*bad*; it. *bagnio*; fr. *bain*; ags. *bæth*.

Bath. **ba´d**, to bathe. Cfr. *βαλανεῖον*; *balneum*, *vadum*; g. d. dan.

Bathos. v. Base.

Batten. v. Fat.

Bawl. v. Bleat, Blare. [g. *bucht*; sp. pg. *bahia*.

Bay. **bhudȷ**, to bend. Cfr. d. *boog*; ags. *byge*; it. *baja*; fr. *baie*;

Be. **bhu´**, to be. Cfr. *φύω*; *fui*, *fetus*; ags. *beon*; g. *bin*. v. Fecund.

Be-. **abhi**, a particle of superiority, proximity, severalty, &c. Cfr. ב in, among, &c.; *ὑπό*; goth. *bi*; g. *bei*, *be-*; ags. *be*, *big*.

Beach. **bha.dȷ**, (**bhadȷyate**,) to break. v. Bang.

Beacon. **patſ**, to make evident. Cfr. בחן a beacon; *specula;* g. *bake;* d. *baak;* ags. *beacen.* [*beten, bethe.*

Bead. **veth**, to ask; **vad**, to speak. Cfr. בטא to speak; *peto;* g.

Beadle. v. Bid.

Beak. v. Peak.

Beam. **bamb**, to go; **bha′**, to shine. Cfr. *βῆμι; φάω.*

Bear. **bhr**, to hold or support; **bha′ra**ˢ, a burthen. Cfr. פרה a branch; *φέρω; fero, pario, por-to, fer-tilis, far-ina, fortuna, fortis;* goth. *bairan;* g. *führen.* [goth. *biarja;* ags. *bera.*

Bear. **vira**ˢ, powerful, mighty. Cfr. פרא wild, fierce; *θήρ; ferus;*

Beast. **paǥu**ˢ, a beast. Cfr. *βοῦς; pecus, bestia;* d. *beest;* fr. *bête.*

Beat. **ba′dh**, to afflict, to strike. Cfr. חבט to beat off; *batuo;*

Beatific. **bha,d**, to make happy. Cfr. *beatus.* [ags. *beatan;* fr. *battre.*

Beau-ty. **bha′**, to shine, beauty. Cfr. *pul-cher, bel-lus;* sp. it. *bello;*

Beck. v. Beacon. [fr. *bel, beau-té.*

Bed. **pa,d**, to collect, to heap up. Cfr. פטם to cram; *pando;* pers.

Bee. v. Apiary. [*bester;* goth. *badi;* ags. *bedde;* g. *bett.*

Beer. v. Barley. [ags. *bitl.* v. Beat.

Beetle. **pith**, to strike, to kill. Cfr. פטש a hammer; *peto; τύπτω;*

Beg. **bhicſ**, to beg. Cfr. בקש to petition.

Be-gin. **dȷan**, to produce. Cfr. גנס lineage; *γένος; genus;* goth. *kin. duginnan;* d. nl. nfrs. *beginnen.* [*heissen.*

Behest, Behight. **cet**, to invite, to counsel. Cfr. goth. *haitan;* g.

Behoof, Behalf. **av**, to aid, to desire, &c.; **cev, chev, gev**, to serve; **ubh**, to fill. Cfr. אבה desire; יאב to long for; כבד to honor; *ὠφελέω; juvo;* ags. *behofian;* g. *behuf;* d. *behoef.*

Bell. **bal**, to strike; **pel, vell**, to move back and forth. Cfr. *βάλλω;*

Belle. v. Beauty. [*pello;* g. d. *bellen.*

Belli-. **bal**, to kill. Cfr. בלע to destroy; *βάλλω; βέλος; bellum.*

Bellow. v. Bleat, Bull, Low. [*follis;* goth. *balgs;* g. d. *balg.*

Bellows, Belly. **pu′l**, to accumulate, to heap. Cfr. *βόλβος; bulga,*

Belo-mancy. **bil**, to throw or cast. v. Belli.

Belong. **lag**, (**lagna,**) to be with or near. Cfr. *λαγχάνω;* g. d.

Beneh. v. Bank. [*belangen.*

Bend. v. Band.

Beneath. v. Nether. [*benè, bonus.*

Bene-. **pun**, to be pure or virtuous; **pan**, to praise. Cfr. *ἐπαινέω;*

Bequeath. v. Quote. [fr. *boise.*

Berry. **bhacſ**, to eat. Cfr. *bacca;* goth. *basi;* ags. *berie;* g. *beere;*

Berth. v. Bear.

Besom. **pas**, to bind, to move, to obstruct or hinder. Cfr. בז, spoil, plunder; בסם a reed; *πάσσω;* ags. *besm;* g. *besen;* d. *bezem.*

Better, Best, (a-bet.) **bath, pat,** to be powerful; **bad,** to be steady or firm; **bhaṭ,** to cherish, or maintain; **bha,d,** to be happy; **bhadraˢ,** excellent. Cfr. בטח to trust; *βελτίων*; *potior*; goth. *batiza, batista*; ags. *betan, betre, best*; g. *besser, beste*; d. *beter,*

Bet. **bhaṭ,** to hire. Cfr. פתה to allure; ags. *bad*; g. *wette.* [*best.*

Beverage, Bib-acious. **paˊ,** (**pibati,**) to drink. Cfr. *πίνω*; *bibo*; it. *bevere*; sp. *beber.* [to command; פחה a governor.

Bey, Beg. **pidȷ,** to adore, to be strong; **bhadȷ,** to serve. Cfr. פקר

Bezel. **paɢ,** to bind. v. Besom.

Bib-, im-Bibe. v. Beverage.

Bid. **put, bad,** to speak; **vidh,** to command. Cfr. בטא to speak; *πείθω*; *invito, peto*; fr. *re-peter*; goth. *bidjan*; g. *beten, bitten*; d. *bidden*; ags. *bidan.*

Bide, (a-bide). **bad,** to be steady or firm; בית a house; *βάθος*; *ha-*

Bier. v. Bear. [*bit-o*; goth. *beidan*; g. *bitan*; ags. *bidan.*

Big, Bight. **bahuˢ,** great; **bhudȷ,** to bend; **mah,** to grow or increase. Cfr. בהו, בק empty; *μέγας*; *magnus.* v. Back.

Bigot. **cuṭ,** to be dishonest; **cuˊṭ,** to be niggardly.

Bijou. v. Jewel.

Bile. **bhil,** to divide or separate; **bal,** to nourish, to support. Cfr. בלג to strengthen; פלא to separate, to put away; *βάλλω*; *pello,*

Bilk. goth. *bilaikan.* v. Balk? [*bilis*; fr. *bile.*

Bill. **bhil,** to divide or separate; **bil,** to cleave; **bal,** to explain. Cfr. פלא to separate; *βάλλω*; *πλήσσω*; *pilum*; ags. *bil, bile.* v. Ball.

Billow. **balaˢ,** strength; **balaˊha,,** water; **puˊl,** to collect, to heap up. Cfr. פלג a river or stream; *πάλλω*; *fluo.*

Bin. **puˊṇ,** to collect. Cfr. *panarium*; goth. *bansts*; fr. *panier.*

Bin-ary. v. Bis.

Bind. v. Band.

Birch, Birken. **bhuˊrdȷaˢ,** a tree, called by travellers a kind of birch; (the bark is used for writing on.) Cfr. ags. *birce*; g. *birke*; d. *berk.*

Birth. v. Bear. Cfr. *partus*; goth. *gabaurth*; g. *geburt*; d.

Bis. v. Both, Bit, Deuce. [*geboorte*; ags. *beorth.*

Bit, Bite. **bhid,** to cut; **bhitta,,** a bit. Cfr. בר to separate; בתר to divide; *di-vido*; goth. *beitan*; g. *beissen*; d. *bijten*; ags. *bitan.*

Blab. **lap, hlap,** to speak. v. Lip.

Black, (Blanch, Blank, Bleach, Bleak.) **lich,** to write to paint; **ladȷ,** to hide, to shine; **lu,tf,** to blot out; **loc,** to see, to shine; **bhlaˊɢ,** to shine. Cfr. *λευκός*; *lux*; g. *bleich*; d. *bleek*; ags. *blac, blæc.*

Bladder, Blade. v. Broad.

Blame, Blas-pheme. **bru´s, vru´s,** to injure. Cfr. fr. *blesser, bla(s)mer;* it. *biasmo;* *βλασ-φημέω, βλάπτω.* v. Bale.

Blare, Blate, Blatter. **mleṭ,** to be mad; **ma´,** to sound; **balh,** to speak; **laṭ,** to speak with difficulty. v. Bleat.

Blaze, Blazon. **pluſ, pruſ, plas,** to burn; **bhla´s,** to shine. Cfr. פאר brightness; *πῦρ, φλογμός;* *flamma;* g. *blasen;* fr. *blaser.*

Bleach, Bleak. v. Black.

Bleat. (Bawl, Bellow, Blate, Blatter.) v. Blare, Peal. Cfr. מלט to leap out; בלט to escape, to cast out; *βληχάομαι;* *balo, blatero, plaudo;* ags. *blætan;* d. *bellen, blaren, blaten;* sw. *bladra.*

Bleed. v. Blood.

Blemish. v. Blame.

Blend, Blind. **andh,** to be blind; **bal,** to kill; **mil,** to mix. Cfr. בלל mixture, a blemish in the eye; בלע to destroy; *τυ-φλός;* g. d. ags. *blind.* [*bleiths;* ags. *bletsian.* v. Glad.

Bless, Bliss, Blithe. **la´d,** to give joy. Cfr. *lætus;* w. *llâd;* goth.

Blight. **bal,** to kill; **ghaṭ,** to injure.

Blood. **bal (balati,)** to live; **bala,,** blood; **plu,** to flow. Cfr. בלג to strengthen; *φλέω, βλύζω;* *fluidus;* goth. *bloth;* g. *blut.*

Bloom, Blossom, Blow. **phull,** to blossom. Cfr. *φλούς, βλάστημα;* *flos;* goth. *bloma;* g. *blume;* ags. *bloma, blosma.*

Blot, Bloteh. **laṭaˢ,** fault, defeet; **latſh,** to mark. Cfr. לוט to eover, to hide; *litura;* goth. *blauthjan.*

Blow, Bludgeon. **bhal,** to strike; **ladȷ, luṭ,** to strike. Cfr. בלק to break, פלח to strike through, *βάλλω, πλήσσω;* *plaga, plango, fligo, flagellum;* goth. *bliggvan;* ags. *bliuwan;* fr. *fleau;* w.

Blowze, Blush. v. Blaze, Flash. [*flangell.*

Blunder. v. Blind. [*beer.* v. Bear.

Boar. **vara´haˢ,** a hog. Cfr. *aper, verres;* ags. *bar;* g. *eber;* d.

Board. v. Broad. [d. *boot;* fr. *batteau;* sp. *bote.*

Boat. **potaˢ,** a boat; **badh,** to bind Cfr. pers. ags. *bat;* g. *bot;*

Bob, Bobbin. **paˌb, baˌb,** to go.

Bode. **budh,** to know, to understand. Cfr. בדק to spy out; ags.

Bog. v. Back. [*bodian, bodigan;* on. *boda.* v. Bid.

-Bogue. (dis-em-.) v. -Bouch. [*bauljan;* fr. *bouillir.*

Boil. **pu´l,** to collect, to heap up. Cfr. *φλύω;* *bullio;* goth. *auf-*

Boisterous. v. Waste.

Bold. **bal, (balati,)** to live; **balaˢ,** robust, powerful. Cfr. *βελτίων;* goth. *baltha;* og. *bald;* ags. *beald;* it. *baldo.* Cfr. Able.

Bolis, Boll, Bolster. v. Balister, Bed.

Bolt. **pa′l**, to guard, to protect; **balaˢ**, strong. Cfr. בלט an oak; *πάλλω, παλτόν, βάλλω; pilum, pello;* ags. *bolta;* g. *bolzen;* d. *bout.*

Bolus. **pu′l**, to heap up. Cfr. *βῶλος; bolus.* v. Balister.

Bomb, Boom. **bamb**, to go. Cfr. פעם to move, an anvil, a bell; *βόμβος.*

Bon, Bonus, Boon. **puṇ**, to be pure or virtuous; **ban**, to ask. Cfr. פוע to shine; *bonus.* v. Bene.

Bond. v. Band.

Boot, Bottle. **puṭ**, to embrace, to bind. Cfr. חבת a bottle; בצר shut up; fr. *botte, bouteille;* it. *botte, bottiglia.*

Booty. **bha′ṭiˢ**, wages, fee.

Booth. v. Bide.

Border. v. Broad.

Bore. v. For-.

Borough. **pura„**, a town, a city. Cfr. פרו a borough; *πύργος*; goth. *bairgs;* ags. *burg;* fr. *bourg;* it. *borgo;* g. d. dan. *burg, berg.*

Bosc-. v. Bush.

Bosh. **bha′ʃ**, to speak. Cfr. בטא to speak; *φάσκω*; *fateor.*

Bosom. **pu′ʃ**, to nourish; **puʃ**, to cherish or nurture, to increase. Cfr. פוש to spread, to become fat, to be fruitful; *φυσάω, βόω*; ags. *bosm;* g. *busen;* d. *boezem.*

Both. **ubhayaˢ**, both. Cfr. בר, בתר to divide; *ϝαμφω*; *ambo, bis;* goth. *bajoths;* g. d. *beide.*

Bother. **ba′dh, piṭh**, to vex. Cfr. בעת to disturb.

Bottle. v. Boot.

Bottom. v. Base.

Bouch, (de-.) **bhudȷ**, to eat. Cfr. *φάγω*; fr. *bouche;* sp. pg. *boca;* it. *bocca.*

Bouge, Bough, Bought. v. Back.

Bound. v. Band.

Bounty. Cfr. *bonitas;* it. *bontà;* fr. *bonté.* v. Bonus.

Bout. v. But.

Bow, Bowels, Bower. v. Back.

Bowl, Bowlder. v. Ball, Bellows.

Box. **pacʃ**, to take. Cfr. פוק to obtain; *πυξίς; buxus;* ags. *box;* g. *büchse.* v. Fight.

Brabble. **rap**, to speak; **rab**, (**ra„b**,) to sound, to go; **rup**, to disturb. Cfr. *rabidus;* d. *rabbelen, brabbelen.*

Brace, Brach-ial, Bracket. **pṛtʃ**, to touch, to join together. Cfr. ברך to bow the knee; *βραχίων; brachium;* sp. *brazo;* fr. *bras, braquer.*

Brachy-. (*βραχύς.*) v. Breve.

Brack. v. Break.

Brady-. **mṛduˢ**, gentle. Cfr. *βραδύς.*

Brag. v. Brave.

Brain. v. Bray, Vary.

Braid. **bhrud**, to cover, to collect. Cfr. פרר to stretch, to scatter.

Bramble. **vran**, to wound. Cfr. ags. *bræmbel;* d. *braam;* g. *brombeere;* fr. *framboise.*

Branch. **bhra.ç**, to fall from. v. Brace, Break.

Brand, Brandy. v. Burn. [*frendo, vi-bro;* fr. *branler, brandir.*

Brandish, Brangle. **vran**, to wound; **vabhr**, to go. Cfr. *vuln-ero,*

Brass. **bhra's**, to shine. Cfr. ברק to glitter; *βράσσω;* pg. *braza;*

Brat. v. Brother. [sp. *brasas.*

Bravado, Brave. **paruſ**, harsh, rough; **ra'gh**, to be able, or equal to. Cfr. פרא fierce; פרק violence; *βράχω; probus;* g. *brav;* it. sp. pg. *bravo;* fr. *brave.* [*ferus, aprugnus.* v. Boar.

Brawn. **pra'naſ**, strength, power; **vara'haſ**, a hog. Cfr. פרא fierce;

Bray, Breach, Break, Brake, Breech. **vragtſ**, (**vṛcna,**) **bha.dȷ**, to break; **ava-rudȷ**, to break. Cfr. רגע, פרק, בלק to break; *ῥάχος, ῥῆγμα, βράχω; fractus, bracca;* goth. *brikan;* g. *brechen;* ags. *brecan, hracod, bracan, bræc;* fr. *broire, breche, braies.*

Breast. v. Bristle.

Breed. v. Broad, Brood. [*βράζω;* it. *brezza;* sp. *brisa.*

Breeze. **rſ, preſ, bhreſ**, to move. Cfr. פרש to spread, to scatter;

Breve, (ab-breviate.) **ri'v**, to take. Cfr. רוץ to break; *ῥῆγ-μα, βραχύς; brevis;* it. sp. *breve;* fr. *bref.* v. Bray.

Brew. **bhṛ'**, to fly; **prdȷ**, to mix. Cfr. *φρύγω; frigo;* ags. *briwan;* g. *brauen;* w. *brwc.*

Bride-groom. **bha'rya'**, a bride; **bhṛ**, to foster, to cherish; **praudhaſ**, married; **prd**, to delight. Cfr. פרה a nuptial bed; ברא to choose; *πρίζω; prendo;* goth. *bruths;* g. *braut;* d. *bruid;* ags. *bryd.* v. Gam.

Bridge. **pari-ga'**, to go around. Cfr. פרק a cross road; *πείρω; pergo;* ags. *brycg;* ofrs. *brigge;* g. *brücke;* d. *brug.* v. Bray, Bring.

Bridle. **bhrud**, to collect, to restrain. Cfr. פרת to gather; ags. *bridel;*

Brief. v. Breve. [d. *breidel;* fr. *bride;* ofrs. sp. *brida.*

Brig. **rig?** to move. [it. *brigata;* sp. pg. *brigada.*

Brigade, Brigand. **prtſ**, to join together. v. Break. fr. *brigade;*

Bright. **barh, bhra'dȷ**, to shine. Cfr. בהר shining; פאר to glorify; *πῦρ;* goth. *bairhts;* ags. *beorht;* g. *pracht.*

Brim-stone, Brindle, Brine. v. Burn. [d. *brengen;* ags. *bringan.*

Bring. **bhṛ**, to bear. Cfr. *φέρω; fero;* goth. *briggan;* g. *bringen;*

Brink. v. Break. [d. *borstel.*

Bristle. **pras**, to spread, or diffuse. Cfr. פרס to spread; g. *borste;*

Brittle. **vardh**, to divide. Cfr. פרר, פרס to divide; פרת broken

Broach. v. Break. [asunder; ags. *brittan;* w. *brad.*

Broad, Board, a-. **prath**, to extend; **prthuſ**, broad. Cfr. פרר to

stretch; πλατύς; *latus, patulus;* goth. *braids;* g. *breit;* d. dan. *breed;* ags. *brad;* fr. d. *plat;* g. *platt;* sw. *flat.*

Broider. v. Braid. fr. *broder;* sp. pg. *bordar;* d. *borduren.*

BROIL. **bhṛ′**, to fry. Cfr. it. *brodo, broglio;* sp. *brodio;* fr. *bruler, brouiller;* d. *braaden;* ags. w. *broth.* v. Brew.

Broker. **vṛc**, to take or accept; **vṛh**, to grow or increase. Cfr. פרג to exchange, to recompense; πρᾶγμα; *fructus;* d. *gebruiken;* g. *brauchen;* ags. *brucan.*

Broncho-cele. v. Branch. **ci′l**, to bind, to fasten with a needle; **cul**, to collect, to heap up. Cfr. כול to contain; κήλη.

Bronto-logy. **braṇ**, to sound. Cfr. βροντή.

Bronze. **bhṛ.ǧ**, to shine. v. Brass, Brown.

Brooch. **prtſ**, to join, to bind together.

Brood, Breed. **bhruḍ, vruḍ**, to cover, to collect. Cfr. ags. *brod; bredan;* g. *brüten;* d. *broeden.*

Brook. **bhṛǧ, bhraǧ**, ′to fall; **bhṛ**, to bear; **rach**, to go. Cfr. ברך a pool of water; בור a ditch; βρέχω, βρύχω; *brachium;* ags. *broc,*

Broom. v. Bramble. [*brucan;* g. *bruch;* d. *broek.* v. Rain.

Broth. v. Broil. [ags. *bord.* v. Board.

Brothel. g. *bordell;* d. *bordeel;* it. *bordello;* sp. *borda;* fr. *borde;*

BROTHER. **bhra′tṛ**, a brother. Cfr. בר a son; φράτρα; *frater;* zend. *brata;* goth. *brothar;* g. *bruder;* d. *broeder;* russ. *brat;* it. *frate;* fr. *frère.*

BROW. **bhru′**, the brow; **bhruḍ**, to cover. Cfr. פרה a canopy; ὀφρύς; *frons, palpe-bra;* goth. *brahv;* on. *bragdhi;* ags. *bruva;* g. *braue;* d. *braauw.* [d. *bruin.* v. Burn.

Brown. **varṇ**, to color. Cfr. ags. fr. *brun;* sp. it. *bruno;* g. *braun;*

Brownie. **prṇ**, to fill, to please or gratify. [Break.

Browse. **ras**, to taste. Cfr. פרש to bite; ברה to eat; βρῶσις. v.

Bruise. **bruſ, vrus**, to strike, to injure. Cfr. פרס to break; ῥήσσω; ags. *brysan;* fr. *briser.* [רור to lament; ῥήτωρ; fr. *bruit.*

Bruit. **bru′**, (**bravi′ti, brute,**) **rut**, to speak; **rat**, to call out. Cfr.

Brunette. v. Brown, Burn.

Brunt. **ruṯh**, to resist.

Brush. sp. it. *brusca;* fr. *brosse.* v. Bristle, Bruise.

Brusque. v. Break. [*tus;* it. sp. *bruto.*

Brute. **rut**, to strike against, to resist. Cfr. פרא wild; θήρ; *bru-*

Bubble, Bubo. **ba.b, pal**, to go; **pu′l**, to collect, to heap up. Cfr. בוב hollow; בל worthless; βολβός; *bubo, bulla;* d. *bobbel.*

BUCC-. **mucha.**, the mouth.

BUCK. **buccaˢ**, a he-goat. Cfr. ags. *bucca;* d. *bok;* g. *bock.*

Bucket, Buckle. v. Back.

Bud. **bhid**, to cut, to break through; **bud**, to cover, to send forth. Cfr. בר to separate; יבט to break through; *φυτόν*; it. *bottone*; [fr. *bouton*; sp. *boton*; d. *bot.*

Buddle. v. Bath.

Budge. v. Back.

Build. **pul**, to be heaped up. Cfr. פ׳ל a gate, a post; *πόλη*; ags. [*byld*; g. *bild*; d. *beeld.*

Bulb. v. Bubble.

Bulge, Bulk. **valg**, to leap. v. Bal-, Bolus, Back, Bubble.

Bull. **bali´**, a bull; **bal**, to kill; **bala**, strength. Cfr. בלע to destroy; *βάλλω*; *bellua, bellum*; g. *bull.* v. Bleat.

Bull, Bullet, Bulwark. v. Balister, Bubble.

Bump. **ba,b**, to go.

Bunch. **pa,tf**, to spread. v. Back.

Bundle. v. Band.

Bungle. **va,c**, to be crooked, to make crooked.

Buoy. g. *boje*; d. *boei*; fr. *bouée.* v. Back.

Bur, Burrow, Bury. **vr**, to cover. Cfr. בור a pit; עבר an inclosure;

Burden. v. Bear. [ags. *bur, burre, byrian, burgan.*

Burg, Burgeois, Burglar. v. Borough.

Burn. **bhr´**, to fry. Cfr. ברק to glitter; *πῦρ*; *pruna, ferveo, furor, fornax*; goth. *brinnan*; ags. *bærnan, bryne*; g. *brennen*; d. [*barnen, branden*; dan. *brænde.* v. Fire.

Burse, Bursar. v. Purse.

Burst. v. Bristle.

Bush. **puf**, to flourish, to grow; **bhu´f**, to adorn. Cfr. פוש to grow up; *φύω*; it. *bosco*; sp. pg. *bosque*; g. *busch*; d. *bosch.*

Bust. **pust**, to bind or tie. v. Waist.

But, Butt, (a-, de-,) **but**, to strike; **badh**, to bind or tie. Cfr. fr. [*bout.* v. Beat.

Butler. v. Boot.

Button. v. Bud.

Buttress. v. But, Truss.

By. **abhi**, near. v. Be-.

Cab, Cabin. **cub**, to cover. Cfr. כבש to cover, כפף to bend, קבר to bury; *κύπτω, κυβή, χαβός*; *capio, caput*; it. *capanna*; sp. pg. *cabana*; fr. *cabane*; w. *caὸ, caban.*

Cable, Couple. **pu´l**, to collect; **capa´las**, assemblage. Cfr. כפל to double: כבל, הבל to bind; *συμβάλλω*; *copulo*; fr. *coupler, cable*; g. d. *kabel*; gael. *cabal.* [*cage, caque*; ags. *cœggian.*

Cache. **catf**, to bind. Cfr. כחד, ככה to hide; *κιχέω*; fr. *cacher,*

Cac-. **cacfas**, sin. Cfr. *κακός.*

Cach-, Cackle, Gaggle, Giggle. **cach, gaggh**, to laugh. Cfr. גול gladness; כחש to crow; צחק to laugh; *γελάω, καγχάζω*; *cachinno*;

Cad. **cud**, to be boyish. [g. *gackern*; sp. *cacarear.*

Cadaverous. **calevara**, the body.

Caddis, Caddy, Cade. **tʃhad**, to cover; **cud** (**cu**,**d**,) to heap, to preserve. Cfr. כד a cask, a vessel; *χάδος*; *cadus*; w. *cadw*.

Cadence. **ʒad**, to fall. Cfr. *cado*; it. *cadere*; sp. pg. *cadencia*; fr. *cadence*. [*κόπτω*, *σχίζω*; *cædo*, *cæs-*.

Cæs- (-arian, -ura.) **ca**,**s**, **tʃhid**, to cut. Cfr. קטב, קטע to cut off;

Cag, Cage, Catch. **catʃ**, to bind; **cudʒ**, to steal. v. Cache.

Caitiff. **chet**, to alarm; **chetaˢ**, vile, bad, low; **chetaˢ**, hunting; **tʃi′v**, to take. Cfr. קטן low, vile, worthless; *χῆτος*; *captivus*; it. *cattivo*; fr. *chétif*.

Cajole. **tʃhal**, to deceive. Cfr. כחל to counterfeit; fr. *cajoler*.

Cake. v. Cook.

Cal-. *χαλός*. v. Clever.

Calabash. **carb**, to go, to approach. Cfr. כרך to swell; קרב to approach; *κάλπη*; *curvus*, *carpentum*; g. *kürbiss*; sp. *calabaza*; fr. *calebasse*.

Calaboose. **cu′l**, to enclose; **labh**, to take. Cfr. כלא to close, to contain, a prison; כלב a cage; *κάλαθος*, *λαμβάνω*; sp. *calabozo*.

Calamar. **ca′laˢ**, black. Cfr. it. *calamaia*; sp. *calamar*.

Calamity. **clam**, to be weary or exhausted. Cfr. כלם dishonor, ignominy; *καλάμη*; *calamitas*.

Calamus. **calamaˢ**, a writing-reed, wild rice. Cfr. כול to support; *καυλός*, *κάλαμος*,; *caulis*, *culmus*, *calamus*.

Calash. **cal**, to go. Cfr. *κέλλω*; ante- ex-*cello*, *pro-cella*; d. *kales*; sp. *calesa*; fr. *calèche*. [*calcular*; fr. *calculer*.

Calculate. **cal**, **cul**, to number. Cfr. *calculo*; it. *calculare*; sp.

Caldron, Cale-fy, Calender. **ul**, **tfur**, to burn; **dʒval**, to shine, to blaze. Cfr. כור a furnace; קלח a caldron; *καίω*; *caleo*, *caldarius*; it. *caldo*, *caldaro*; sp. *calda*, *caldera*; fr. *chaud-ron*. [v. Call.

Calendar. **ca′laˢ**, time. Cfr. חלד time; כלח old age; *καλέω*? *calendæ*.

Calf. **calaˢ**, weak; **cal**, to cast; **calabhaˢ**, a young elephant; **garbha**, offspring. Cfr. חלך weak; חלף to spring, to grow up; *κάλπις*; *calvus*; goth. *kalbo*; g. *kahl*, *kalbe*; os. nl. d. ags. *kalf*.

Caliginous. **ca′laˢ**, black; **chaludʒ**, obscurity. Cfr. כלא to shut up; *caligo*; goth. *halja*.

Call. **cal**, to sound, to throw or cast. Cfr. קול sound; כלא to call aloud; *καλέω*; *gallus*, *calator*; ags. *gyllan*; g. *gällen*; d. *kallen*; w. *galw*; fr. *challenge*.

Calli-. **calyaˢ**, sound, perfect. Cfr. *καλός*; goth. *hails*.

Callipers. **cu′l**, to enclose; **pṛ**, to fill. Cfr. כול, כלא to contain; פאר to be puffed up; *καλύπτω*?

Callid, Callous, Could. **cal**, to throw, seize, count, think, observe, hold, &c. Cfr. כלל to perfect; יכל to bring, to lead; *calleo.*

Callow. v. Calf.

Calm. **clam**, to be wearied; **gam**, to be appeased, to calm. Cfr. חלם to sleep, to dream; *χαλάω*; it. sp. pg. *calma*; fr. *calme.*

Calumny. **cal**, to cast; **hul**, to strike. Cfr. כלם calumny; *calumnia*; fr. *calomnie*; goth. *holon*; ags. *holan.*

Calx. **ǧila´**, a rock; **calca**, dirt, sediment. Cfr. כלע a rock; *χάλιξ*; *silex, calx*; g. d. dan. *kalk*; fr. *chaux.*

Calyptra, apo-Calypse. v. Callipers.

Calyx. **cu´l**, to enclose; **calica´**, a bud; **calaǧa.**, an earthen pot. Cfr. כלא, כול to contain; *κύλιξ, κάλυξ*; *calyx*; ags. *calic*; it. fr. *calice*; g. *kelch*; d. *kelk.*

Cam, Camber, Cambrel, Camera, Camous. **cmar**, to be crooked. Cfr. קמר to gird; *καμάρα*; *hamatus, camera*; fr. *cambrer, chambre, camus*; w. *cam*; sp. pg. *camara*; g. *kammer*; d. *kamer.*

Camel. **cramelaˢ**, a camel. Cfr. גמל a camel; *κάμηλος*; *camelus*; g. *kamel*; d. dan. *kameel*; ags. *gamol.* v. Cam.

Camisade. **ǧaman**, quiet; **if**, to give. Cfr. שאן tranquil; *κῶμα, κάμνω*; *somnus*; it. *camiscia*; sp. pg. *camisa*; fr. *chemise.*

Camp. **ca.p**, to shake, to tremble; **cup**, to be angry; **cu.p**, to spread. Cfr. חפז to tremble, to hasten; קוף a circuit; *κύπτω*; *κάμπτω*; *campus*; it. sp. pg. *campo*; fr. *camp, champ*; g. d. *kamp.*

Camphor. **carpu´raˢ**, camphor. Cfr. כפר camphor; *καφουρά*; g. d. *kamfer*; fr. *camphre.*

Can, Canister. **cu´n**, to contract or close. Cfr. גנן covering; כנס to gather together; *κάννα, κάναστρον, κάνθαρος*; *canistrum*; g. *kanne*; d. *kan*; ags. *canna*; w. *cant*; fr. *canastre.*

Can. **dǰan**, to produce; **dǰna´**, to know. Cfr. *γεννάω, γνώσκω*; prs. *kunda*; goth. *kunnan*; ags. *cunnan*; g. *kennen, können*; d. *kunnen.* v. Begin. [Cane.

Canal. **chan**, to dig. Cfr. *χαίνω*; *canalis*; fr. sp. pg. *canal.* v.

Cancel. **ca.tf, cil**, to bind. Cfr. קנק a lattice; *κιγκλίς*; *cancello.*

Cancer. v. Conch.

Candid, Candle, Candor. **can, tfa.d**, to shine. Cfr. כוה, יקד to burn; *γάνος*; *scintillo, candeo, -cendo*; w. *canu*; g. *scheinen, schön*; prs. *kandil*; sp. it. *candela*; fr. *chandelle*; ags. *candel.*

Candy. **chandaˢ**, candied treacle; **chand**, to break; **chanda.**, a kind of sugar cane. Cfr. קכה sweet cane; חנט to sweeten; *condio*; it. *candire.*

Cane, Canon. **can**, to go; **ca´ndaˢ**, a stem, a reed. Cfr. קנה a reed; *κάννα, κάνων*; *canna*; sp. pg. *cana*; fr. *canne.*

CANINE, Canaille. **ɕvan**, (**ɕun**,) a dog. Cfr. *κύων*; *canis*; goth. *hunds*; os. g. d. ags. *hund*; fr. *chien*.

Cannabine. **ɕaniϛ**, hemp. Cfr. קנה linen; *κάνναβις*; *cannabis*; ir. *canaib*; ags. *hænep*; g. *hanf*; d. *hennep*; dan. *hamp*; fr.

Cannon, Canoe. v. Cane. (**can**, to sound?) Canny. v. Can. [*chanvre*.

Cant, Canter. **ca.t**, to go. Cfr. חנט to shoot forth; חנת a spear; *ἀκοντίζω*.

CANTO. **can**, (**canati**,) **tʃan**, to sound. Cfr. כנר a harp; *καναχή*; *cano, canto*; it. *canto*; sp. pg. *cantar*; fr. *chanter*.

Canvas. v. Cannabine. Cfr. d. *kanefas*; it. *canavaccio*; fr. *canevas*.

Canvass. **baʃ**, **vaʃ**, to strike. Cfr. ofr. *cannabasser*.

CAP, Cape, Capital, Captain. **cu.p**, to cover. Cfr. כפש to cover; *καλύπ-τω*, *κυβή*, *κῦφων*; *caput*; g. *kappe*; d. *kaap*, *kap*; ags. *cæppe*; fr. *chef*, *chapeau*; it. *cappa*, *capo*; w. *cap*. v. Cephalic.

Capable. **cɾp**, to be able. Cfr. *capax*; fr. *capable*.

Capon. **tʃap**, to pound. Cfr. כפר to cut off; *κόπτω*, *κάπων*; *capo*; g. *kapaun*, *kappen*; d. *kappen*, *kapoen*; fr. *couper*, *chapon*.

Caprice. **vɾɕ**, to choose.

Cap-ture. v. Cip.

CAR. **tʃar**, to go. Cfr. כרר to dance; קור to flow; *carrus*, *curro*; g. d. *karre*; w. *car*; fr. *courir*, *char*; sp. it. pg. *carro*.

CARBON. **tʃu′r**, to burn; **bha′**, to shine; **ɕra′**, to cook, to sweat. Cfr. כור a furnace; חרה to kindle; צרב to burn; *κάρφω*, *ἐσχάρα*; *carbo*; it. *carbone*; sp. *carbon*; fr. *charbon*.

Carcass. **tʃartʃ**, to kill. Cfr. קרץ destruction; d. *karkas*; it. pg. *carcassa*; fr. *carcasse*.

CARCER. **ca′ra′**, a prison, binding; **tʃacraϛ**, a wheel. Cfr. כרך to bind; כרכב a circle; *κίρκος*, *κύκλος*; *carcer*, *circus*, *curvus*; goth. *karkara*; g. *kerker*; os. *karkâri*; og. *hring*; goth. g. *rings*.

Carcinoma. **carcataϛ**, a crab. Cfr. *καρκίνος*, *καρκίνωμα*.

Card. **chur**, (**churati**,) **cɾt**, to cut. Cfr. כרת to cut off; *καράττω*, *κάρτης*; *carduus*, *caro*, *careo*, *charta*, *curtus*; g. *karte*; d. *kaard*, *kaart*; dan. *kort*, *karde*; sp. pg. *carda*; fr. *carde*.

CARDIAC. **hɾd**, the heart. Cfr. קיר the ventricles of the heart; *κάρδια*; *cor*; goth. *hairto*; g. *herz*; ags. *heorte*; fr. *cœur*.

CARE. **cɾ**, to make, to do; **ca′raϛ**, effort; **ca′ra′**, affliction. Cfr. כרה sick, to prepare; *χῆρος*, *κῦρος*; *creo*, *cura*; goth. *kara*; w.

Career. v. Car. [*cur*; ags. *cearig*.

Caress. **ras**, to love. Cfr. ארש a desire; ארש to betroth; *ἔρως*; *carus*; fr. *caresser*. v. Care.

Caret, Caries. v. Card.

Cargo. **grḥ**, to take. Cfr. כרג tribute; it. *caricare, carico;* sp. *cargar, cargo;* fr. *charge.* v. Car.

Carminative. **gra´m**, to eall; **cur, maṇ**, to sound. Cfr. *χάρμα;* *carmen;* fr. *charme;* ags. *cyrm;* w. *garm.*

Carmine. **crmis**, a worm, an inseet, the red dye. Cfr. קרא a worm; כרכל crimson; it. *carmesino, carminio;* sp. fr. *carmin.*

Carnal, Carnelian. **ci´ra**,, flesh. Cfr. שאר flesh; *κρέας;* *carn-;* fr. *charnel.*

Carol. **cur**, to sound. Cfr. קול sound; קרא to eall; it. *carola.*

Carp-al. **carabhaꜱ**, the wrist; **gṛḥ, gṛbh**, to seize. Cfr. נרף the fist;

Carry, Cart. v. Car. [*ἁρπάζω;* *carpo, carpus;* it. *carpire.*

Cart -el, -oon, -ouch. v. Card.

Carve. **chur**, to eut; **cṛ´, va´**, to strike. **ɡarv**, to strike. Cfr. חרב a knife; *κείρω;* *caro, carpo;* g. *kerpen;* d. *kerven;* ags. *cearfen;* fr. *crever.* v. Seulp-.

Cascade, Case, Casual. **cas**, to go, to move; **caṭ**, to go, to rain. Cfr. *cado, casus;* it. sp. pg. *caso;* fr. *cas, cascade;* it. *cascata.*

Case, (-mate, -ment,) Caste, Castle. **cus**, to embraee; **tfi**, to eolleet. Cfr. כסה to cover; *κάδος, κύστις, κίστη;* *cista;* goth. g. *kas;* dan. *kasse;* ags. *cest;* fr. *caisse;* it. *cassa, casa.*

Castigate. **caɡ, caf**, to hurt; **casa´**, a whip; **tig**, to assail. Cfr. קצה to smite; תכך to punish; *castigare;* sp. pg. *castigar;* fr.

Castor. **castu´ri´**, mark. Cfr *κάστωρ;* fr. sp. pg. *castor.* [*chatier.*

Cassiteria, (Caster?) **casti´ra**,, tin. Cfr. *κασσίτερος;* *cassiteron.*

Cat. **caṭ**, to approach; **ciṭ**, to approach, to terrify; **tfaṭ**, to kill. Cfr. קטל to slay; קוט to eontend with; *κατά;* *κτεί-νω;* *catus;* it. *gatto;* sp. pg. *gato;* fr. *chat;* g. *kätze;* d. dan. *kat.*

Cata-. **caṭ**, to go, to approach, to encompass, to appear. Cfr. כות like it; *κατά.*

— comb. **cu¸b**, to eover. Cfr. קבר a sepulchre; *κύμβος.*

— raet. **riɡ, ruɡ, rcf, rif, ruf**, to strike. Cfr. רקף to strike against; רסס bruised; *ῥάσσω, ῥάξω, καταράκτης;* *cataracta.*

— rrh. **r**, to go. Cfr. *καταῤῥους;* *catarrhus.*

Cateh. v. Cage.

Catechise. **ya´tf**, to ask; **vatf**, to speak; **chya´**, to narrate. Cfr. יכח to dispute; אחה yells; *κατ-ηχ-έω,-ίζω.*

Catenary. **ci´ṭ**, to bind; **caṭ**, to encompass. Cfr. כתר to compass, to enclose; קטר to bind; *κίστη;* *catena;* sp. *cadena;* g. *kette;* d. *keten;* fr. *chaine.*

Cater, Cates. **chet**, to eat; **ghaṭ**, to act, to strive or endeavor;

tʃat, to ask, to seek. Cfr. *κάπτω*; *capto*; it. *cattare*; sp. *captar*; fr. *capter, acheter.*

Cathartic. **ǥudh,** to cleanse, or purify. Cfr. חטא to cleanse, to purify from sin; הדר beauty, glory; *κάθαρσις*; *catharticus,*

Cath-olic. v. All. [*castus (cad-tus?)*

Cathode. **hu´d,** to go. Cfr. *ὁδός*. [גית cattle.

Cattle. **gotra´,** a herd of kine; **gadi,** a steer; **gotra„** wealth. Cfr.

Caudle, Caustic, Cautery. **cut.** to be hot; **ca´s,** to shine. v. Hot.

CAUL. **cul,** to collect. v. Hold, Calamus.

Cautious. **cit,** to know; **tʃit,** to observe. Cfr. *κοέω, ἀκούω*; *caveo, cautus*; goth. *skavja, skaus, skauns*; g. *schauen, schön.*

Cavalry. **aǥvaˢ,** a horse. Cfr. *καβάλλης*; *caballus*; sp. *caballo*; fr. *cheval, cavalerie.*

CAVE. **dʒabh,** to gape; **cu̯b,** to cover. Cfr. קבר a grave, קוף a vase; *κύπη, κύπελλον, κυφός*; *cavea, cupa*; it. *cava*; fr. *cave.*

Cavern. **gahvara„** a cavern. [v. Coop.

CEASE. **cas,** to go. v. Cede.

CEDE. (ac-, con-, de-, pre-, &c.) **ʃad, sad, (sidati,)** to go or move, to lack energy. Cfr. *χάζω*; *cedo*; it. *cedere*; sp. pg. fr. *ceder.*

Ceil, -Ceal, (con-ceal.) **ǥal,** to cover; **tʃil,** to clothe. Cfr. כלא to shut up. *καλ-ύπτω*; *celo*; fr. *celer.*

-Ceive. (con-, de-, re-, per-.) **tʃi´v,** to take. v. Cip-.

-Cele. (Broncho-, Cysto-.) v. Cell.

CEL-er-ity. (ac-, ex-,) **ǥal, r̥,** to run; **sel, cel,** to go. Cfr. צלח to go; קלל swift; *κέλλω*; *salio, celer*; it. *celerità*; sp. *celeridad*; fr. *celerité.*

Celestial, Celiac. **cha„** sky, vacuity; **chilaˢ,** void. Cfr. קול a bowl; *χάος, κοῖλος*; *cœlum, cœliacus*; goth. *hali*; g. *hohl*; d. ags. *hol.*

CELL-ar, Celt. **cul,** to collect; **ǥal, hul,** to cover; **ǥa´la´,** a house. Cfr. כלא a prison, a sheepfold; *καλ-ύπτω, κήλη, καλιά, κοῖλος*; *celo, cella*; goth. *hallus*; g. *keller*; d. *kelder*; it. pg. *cella*; w. *celt, celtiad*; it. *sala*; fr. *salon.* [*σύν*; *cum, cœmentum*; fr. *ciment.*

Cement. **sam,** together; **a̯t,** to bind. Cfr. שמע to gather together;

Cemetery. **ǥam,** to be tranquil. Cfr. *κοιμάω, κοιμητήριον*; *cœmeterium.*

-CEND. (ac-, in,-). v. Candid.

Ceno-taph. **ḍap,** to heap up; **tap,** to burn. Cfr. *θάπτω, τάφος.*

Censer. **ca´.ǥ, can,** to shine.

Censor. **ǥa̯s,** to point out, to praise, to injure. Cfr. *censeo, censor.*

CENT. v. Hundred. [pg. it. *centro.*

CENTRE. **cendra„** centre. Cfr. *κέντρον*; *centrum*; fr. *centre*; sp.

CEPHALIC. **capa´la$**, the skull. Cfr. *κεφαλή*; *caput, capillus*; goth. *haubith*; ags. *heafod*; g. *kopf, haupt*; d. *kop, hoofd.*

-Cept-. v. Ceive.

Cereb-ral. v. Cranium.

Ceremony. **cr**, to act, to make. Cfr. קרה to prepare; *χείρ*; *ceremonia*, [*creo*; fr. *ceremonie.*

-CERN. (con-, dis-,) } **cr´**, to know; **carn**, to pierce; **ɢrat**, a particle
CERTAIN. (as-,) } and prefix, implying belief or reverence. Cfr. כרה to know; *χρίνω, χρίσις, χάρτα*; *cerno, credo, crimen, certus*;

Cervine. v. Cranium.

CESPITOUS. **ɢaʃpa„**, young grass. Cfr. *cæspes.* [it. pg. *certo*; fr. *certain.*

Cesura. **caʃ**, to strike; **cut**, to cut. Cfr. כסח, קטב to cut; *σχίζω*; *cædo, cæsum, cæsura*; fr. *césure.*

Chaffer. **tʃi**, to collect; **a´p**, to obtain. Cfr. *χέω*; *ἀφάω*; g. *kaufen*; [d. *koopen*; ags. *ceapian.*

Chain. v. Catenary.

Chair. **ʃad**, (**sad**,) to sit. Cfr. שרך to rest; *sedeo*; w. *cadair*; fr. [*cháire*, contracted from *cadiere.*

Chalc-. **hri´cu$**, **hli´cu$**, tin. Cfr. *χαλκός.*

CHALICE. v. Calyx.

Chalk. v. Calx.

Challenge. **a‚dʒ**, **la‚dʒ**, **lu‚dʒ**, to speak. v. Call.

Chamade. v. Claim.

Chamber-lain. **lain**, to go. v. Cam.

Champ. **tʃap**, to grind, to pound; **tʃam**, to eat; **cʃip**, to throw or cast. Cfr. קפר to cut off; *κόπτω*; fr. *couper, champayer.*

Champain, Champion. v. Camp.

Chance. **ca‚s**, to go; **ɢad**, to fall. Cfr. g. *schanze*; d. *kans*; fr. [*chance.* v. Cadence.

Chancel, Chancery. v. Cancel.

CHANDELIER. v. Candid.

Change. **cʃa‚dʒ**, **tʃa‚tʃ**, to go. Cfr. it. *cangiare*; fr. *changer.*

CHANNEL. v. Canal.

CHANT. v. Canto.

Chaos. v. Celestial.

Chap. **dʒabh**, to gape. v. Chop, Gape.

Chap, (-eau,-el,-iter,-lain,-let,-ter.) v. Cap, Chaffer.

CHAR, CHORE. **tʃar**, to go, to act; **tʃu´r**, to burn. Cfr. קרה to meet, to prepare; *χωρέω.* v. Carbon.

CHARACTER. **chur**, to cut, to dig. Cfr. *χαράσσω, χαραχτήρ*; *character*; it. *carattere*; fr. *charactère.* v. Card.

Charge, Chariot, Charon. v. Car, Cargo.

Charge. **tʃartʃ**, **dʒardʒ**, to speak, to blame.

Charity. (*car-itas.*) v. Care, Comity.

Charm. v. Carminative.

Charnel. v. Carnal.
Chart, (-el,-er.) v. Card.
Chary. v. Care.
Chase. **tʃagh**, **caʃ**, **chaʃ**, **tʃaʃ**, to strike, to kill; **ǥaǥ**, to leap. Cfr. קשת to shoot; כחר to destroy; *cogo*; it. *cacciare*; sp. *cazar*; fr. *chasser*. v. Seek. [Cfr. כסח torn; *χαίνω*, *χάσμα*.
Chasm. **tʃun**, to cut; **chan**, to dig; **cas**, to cut; **cus**, to embrace.
Chaste, (-en, -ise.) **cus**, to embrace. Cfr. *κύω*, *κεστός*; *castus*; it. sp. pg. *casto*; fr. *chaste*. v. Cast, Castigate, Cathartic.
CHAT. **tʃat**, to ask; **tʃatu**, agreeable discourse; **cath**, to narrate. Cfr. חדה to rejoice; חוד to speak in parables; *κωτίλλω*; *in-quit*;
Chattels. **tʃatulaˁ**, placing, fixing. [d. *kouten*.
CHAW. **tʃah**, to grind; **tʃarv**, to chew. Cfr. *σιαγών*; g. *kauen*;
Cheap. v. Chaffer. [d. *kaauwen*.
CHEAT. **tʃa′taˁ**, a rogue. Cfr. חחף to rob.
Check. **tʃac**, to repel, to resist. Cfr. שכך to still.
Cheer. **cur**, to sound. Cfr. קרא to proclaim; *χαίρω*; ir. *gairim*; fr. *chère*. v. Care.
Chelonian. **harmutáˁ**, a tortoise. Cfr. *χέλυς*, *χελώνη*.
Chemise. v. Camisade.
CHEST. v. Case.
Chevalier. v. Cavalry.
Chew. v. Chaw.
Chide. **tʃad**, to be angry. Cfr. קוט to contend with; ags. *cidan*.
Chief. v. Cap, Achieve.
Child. (ags. *cild*.) **cil**, **tʃal**, to play, to cast. v. Calf.
Chiliad. **cal**, to count; **cul**, to collect, to count; **chal**, to collect. Cfr. קהל to assemble, a congregation; כול to hold; *χιλιάς*.
CHILL. **dʒal**, to be cold; **tʃal**, **tʃel**, to shake. Cfr. גלד frozen; *κρ-ύος*; *gel-idus*; goth. *kalds*; ags. *cyl*, *col*, *ceald*; g. *kalt*, *kühl*; d. *kil*, *koel*, *koud*; fr. *geler*; sp. *jalea*.
CHIN. **hanuˁ**, the jaw. Cfr. *γένυς*; *gena*; goth. *kinnus*; ags. *cinne*;
China. **tʃi′na**, China. [g. *kinn*; d. *kin*.
Chine, Chink. v. Chasm.
Chip. v. Champ.
CHIR-ography. **cr**, to do, to make; **caraˁ**, the hand; **hr**, to seize; **haranaˁ**, the hand. Cfr. כרה to prepare; *χείρ*; *creo*, *cohors*.
CHISEL. **cas**, to cut. Cfr. גזר an edge tool; גזז to cut; *cuspis*; fr. *ciseau*, *ciseler*.
Chit. **tʃat**, to cut; **tʃit**, to send; **dʒa′taˁ**, a child.
Chivalry. v. Cavalry.

Chlorine. v. Green.

Choir. **cur, ghur,** to sound; **ga´,** to sing, to go; **i´r, tfar,** to go. Cfr. קרא an assembly, to proclaim; *χωρέω, χορός*; sp. pg. it. *coro;* fr. *chœur;* ags. g. *chor;* d. *koor.*

Choke. **tfacc,** to torment, to inflict pain.

Chol-. **ca´las,** black. v. Alcohol.

Chondro-. **tfha‚d,** to cover; **cha‚d,** to break, to grind. Cfr. *χόνδρος.*

Chop. v. Champ, Chaffer.

Choose. **dȷuf,** to investigate, to like; **gef,** to seek. Cfr. נשש to grope; *quæso;* goth. *kiusan;* ags. *ceosan;* g. *kiesen;* fr. *choisir.*

Chord. **crt,** to encompass; **tfṛt,** to tie. Cfr. כרר to tie, to bind; *χορδή; chorda;* goth. *gairda;* g. *gurt;* d. *koord;* it. *corda;*

Chore. v. Char. [fr. *corde;* w. *cord.* v. Career, Curl.

Chor-. v. Choir, Chord. [*χρίω; χρισ-; fric-.*

Chris-. **cṛ´, ghṛ,** to pour out, to scatter. Cfr. קור to gush out;

Chromatic. **charus,** white; **haris,** tawny. Cfr. קרח spotted; חור white; *χρώμα.*

Chuck. (wood-.) **ɕu´caras,** a hog. Cfr. pers. zend. *chuk.*

Chuckle. v. Cach-.

Chud. **cfad,** to eat.

Chunk. **tfuṇ,** to cut.

Church. v. Cyrio-. Career.

Churme. ags. *cyrm.* v. Carminative.

Churn. **tfu´rṇ,** to pound. Cfr. ags. *cyrin, cernan.*

Chute. **tfyut,** to fall. Cfr. fr. *chute.* v. Cadence.

Chyle. v. Diachylum.

Cid-. (ac-, in-, de-, oc-,) v. Cadence, Caes-.

-Cide. **ɕath,** to kill.

Cil. (con-, coun-, os-.) v. Call, Cel-.

-Cile, -Cle. (domi-, taberna-.) **ɕal,** to cover; **ɕa´la´,** a hall. Cfr. הכל a palace, a temple; *καλ-ύπτω; -cilium, -culum.* v. Ceil, Cell.

Cincture. **fa‚dȷ, sa‚dȷ,** to embrace, to cling to. Cfr. *cinctura;*

Cinder. fr. *cendre.* v. Candid. [fr. *enceindre.*

Cinque. **pa‚tfan,** five. Cfr. *πέντε; quinque;* fr. *cinque.*

Cion. **ɕi,** to sharpen.

Cip-. (anti-, per-, re-,) **tfi´b,** to take. Cfr. שבה to take captive; כף the hollow of the hand; *capio.*

Circ-. v. Carcer, Chord.

Cirr-. v. Curl.

-Cise. v. Caes-.

-Cist. v. Case.

Cit-. **fev, sev**, to serve, to dwell; **ǥi′**, to lie down, **a′-ǥi′**, to dwell. Cfr. שבט a tribe; *κει-; κοι-; κῶμος, κῶμη; civitas, civis;* it. *città;* sp. *ciudad;* fr. *cité.*

Cite. (ac-, ex-, in-, re-.) **cet**, to invite; **cath**, to narrate. Cfr. *cito;* goth. *haitan;* ags. *hætan;* d. *heeten;* sp. pg. *citar;* fr. *citer.*

Civ-. v. Cit.

Cl-. **cal**, to sound, seize, go, count, think; **cul**, to collect.

Clack. **cal**, to sound; **loc**, to speak. Cfr. גיל a bell; לאך a message; *καλέω, λαχέω, ληκέω; loquor, glocio;* ags. *clugga, cloccan;* d. *klok, klakken;* fr. *claquer, cloche.*

Claim, Clam-. (ac-, de-, pro-, re-.) **gra′m**, to call. Cfr. קרא, כלא to call; *κάλεω; clamo;* ags. *hlem;* ir. *glam;* fr. *clameur.* v. Clamber. v. Clim-. [Call.

Clan. **cul**, to collect, to be of kin; **cula**, family tribe. Cfr. קהל a congregation; כלא to contain; ir. *clann.*

Clang, Clank. **la,gh**, to move, to speak. Cfr. קול sound; *κλάγγω; clango;* g. *klang;* d. *klank.*

Clap. **clap**, to speak, to make a noise. Cfr. כלא to roar; *κολάπτω; crepo, alapa;* g. d. *klappen;* ags. *clappan;* fr. *clapper.*

Clash, Clatter. **hlas**, to sound; **clad**, to cry out; **cleǥ**, to impede, to strike, to speak. Cfr. *κλάζω, κέλαδος; classicum;* g. *klatschen;* d. *kletsen, klateren.*

Clasp, Class, Clause, Clavicle. (**cala′**, a small part.) v. Clan. Cfr. קלט contracted; *κλειστός; classis, clausus.*

Clavate, Clove, Club. **crv**, to strike, to kill; **lup**, to cut; **tfulump**, to break. Cfr. כלף, כלב, an axe, a hammer; חלף knives; *κλάβα; clava;* w. *clwpa;* g. *klöpfel;* d. *klaver.*

Claw, Cleat, Clew. **cul**, to collect. Cfr. *χηλή;* g. *klaue, klobeın;* d. *klaauw, kluwen.* v. Clan. [g. d. *klei;* fr. *glu.*

Clay. **li′, lag**, to adhere; **cul**, to collect. Cfr. *γλία, κόλλα; lutum;*

Cleave. **lup**, to cut off. Cfr. *λέπειν;* g. *klieben, klippe;* d. *klieven,*

Clepe. v. Clap. [*klip;* ags. *clif, cliofian.* v. Clavate.

Clever. **calya**ˢ, skilful, perfect; **vara**ˢ, excellent. Cfr. כלה to finish;

Click. v. Clack. [בר to purify; *καλός.*

Cliff. v. Cleave.

Clim-. } **cram, lain**, to go. Cfr. *κλίμαξ.*

Clin-. } **li′**, (**li′na**,) to adhere. Cfr. *κλίνω.*

Clip. **calpana**ˢ, cutting. Cfr. ags. *clypan.* v. Cleave.

Cloak. **hlag**, to cover. Cfr. כול to contain; כרך a cloak; *χλαῖνα,*

Clock. v. Clack. [*χλαμύς;* d. *laken;* ags. *lach.*

Clod, Clot. **clid**, to be moist; **lut**, to adhere, to roll on the ground. Cfr. *κλόζω*; *lutum*; g. *klosz, klotz*; d. *kloot, kluit*; w. *cluder*.

Cloister, Close. v. Clasp. [v. Clan, Clasp.

Cloth. **gud**, **tfil**, to clothe; **lud**, **crt**, to cover. Cfr. חלץ apparel; לאט to cover; *κλειδόω*; *celo, claudo*; g. *kleid*; d. *kleed*; ags. *clath*. v. Clasp.

Cloud, (Clout. v. Clod, Cloth.) **dȷaladaˢ**, a cloud.

Clove. **lava**,, cloves. v. Clavate.

Clown. (*colonus*.) v. Colony.

Club. v. Clavate.

Cluck. v. Clack.

-Clude, Cluster, Clutter. v. Clasp.

Clutch. **grutf**, to steal.

Clyster. v. Clod.

Co-. v. Con-. [it. *cocchio*; sp. fr. *coche*.

Coach. **cat**, to go, to cover; **cutf**, to go. Cfr. g. *kutsche*; d. *kœts*;

Coal. **ca´laˢ**, black; **ul**, **dȷval**, to burn. Cfr. נחל a live coal; *κηλόω*; *caleo*; ir. *gual*; ags. *col*; g. *kohle*; d. *kool*.

Coast. **ca´ftha´**, limit, boundary; **cas**, (**casati**,) to approach; **cus**, to embrace. Cfr. קצה extremity, end; *costa*; fr. *coste, côte*; [g. *küste*; d. *kust*.

Coat. v. Catenary.

Cob. v. Cap.

Cock. **cac**, to be proud. Cfr. ags. *coc*; fr. *coq*.

Cochlea-, Cockle. v. Conch.

Cocoon. fr. *cocon*. **cu´n**, to contract or close.

-Coct. v. Cook.

Cod, Code. **cud**, to collect; **cad**, to cut, to preserve. Cfr. כר a vessel; *σχέδη*; *codex*; it. *codice*; sp. *codigo*; fr. *code*.

Coff-er, -in, Coif. **cu,bh**, to cover. Cfr. *κόφινος*; g. d. *koffer*; fr. [*coffre, cofin*; sp. pg. *cofre*. v. Cap.

Cognize. v. Co-, Know.

Cohort. v. Chir-.

Coil, Colco-, Cullis. **chal**, to gather; **cul**, to collect, to flow homogeneously. Cfr. *κολεός*; *colo, coluber*; fr. *cueillir, couler*; it. *cogliere*. v. Calyx.

Coin. **tfun**, to cut; **cona**, a corner, an angle. Cfr. *γωνία*; *cuneus*; pg. *cunho, quina*; sp. *cuña, esquina*; it. *conio*; fr. *coin*.

Colander. v. Coil.

Cold, Cool. v. Chill.

Color. v. Al-cohol.

Collar, (de-collate.) **galaˢ**, the throat. Cfr. קלר a collar; *τράχηλος*; *gula, collum, collare*; sp. *collar*; goth. os. g. d. nl. *hals*.

Collect. (A.) **hlag**, to collect. [to nourish, to contain; *colo-nia.*
Colony, (ac-colent.) **cul**, to collect; **cal**, to go. Cfr. כול to support,
Colt. v. Child.
Coluber. v. Coil.
Column. v. Culminate.
Com.. v. Con-.
COMA. **ɢam**, to be tranquil. Cfr. שאן tranquil; *κῶμα*; *somnus.*
COME. **gam**, to go, to approach. Cfr. קום to arise, to assault; *κομίζω*; *comes*; goth. *quiman*; g. *kommen*; d. *komen*; ags.
COMELY. **comalaˢ**, beautiful, pleasing. [*cuman.*
Comity. **cam**, to desire, to love. Cfr. כמה to desire greatly; *κομέω*; *comis, carus,* (ca[*m*]*rus*;) ir. *caomh.* v. Cit-.
COMMOD-. v. Con, Mode.
COMMON. **saˊmaˊnyaˢ**, common. Cfr. שמע to gather together; *κοινός*; *communis*; goth. *gamains*; g. *gemein*; d. *gemeen*; ags. *gemaen*; fr. *commun.* [*communiquer*; it. *comunicare.*
Com-mune. **maˊn**, to consider. Cfr. *com-munico*; fr. *communier,*
Com-pany. **pen̤**, to go. Cfr. פנה to go away; *συμ-βαίνω*; *pen-na*; it. *compagnia*; sp. *compañia*; fr. *compagnie.*
Complice. v. Plic-.
Compt. v. Accompt, Count.
Comrade. v. Cam.
ɢON-. **sam**, together, with; **cuˊn̤**, to contract, or close. Cfr. קמץ, קמר צמד to close up; שמע to gather together; *σύν*; *cum*; goth. *ga-*; ags. g. d. *ge-.*
CON. v. Can.
CONCH. **ɢancha**ˢ, a shell. Cfr. חנק a band; *κόγχη*; *concha*; fr. *conque.*
-Cond. (abs-, re-,) **cun̤d**, to keep, to preserve. Cfr. *condo.*
Condiment-, Condite. v. Candy.
CONE. **can**, to go; **cuˊn̤**, to curve; **ɢaˊn**, to sharpen; **con̤a**ˢ, an angle. Cfr. קנף a tent; *κῶνος*; *conus*; it. sp. *cono*; fr. *cone*; w. *con.* [goth. *thairh.*
Con-tra-ry. **tr̤ˊ**, to overcome, to surpass. Cfr. *τερέω*; *trans, con-tra*;
Con-tund, -tuse. **tud**, to beat, to strike. Cfr. *tundo.*
Con-vey. **vah**, to carry. Cfr. *veho.*
Coo. **cu**, to sound, to complain. v. Cuckoo.
Cook. **patf**, (**pactu**„) to cook; **cvath**, to boil. Cfr. *πέπτω*; *coquo*;
COOL. v. Chill. [g. *kochen*; d. *koken*; ags. *cocan*; sp. *cocer.*
COOLY. v. Clan.
Coom, Comb. **ɢa.b**, to collect. Cfr. *κύμβη*; *cumulus.*

Coop. **cu′pas**, a eave, a hollow. Cfr. קוף a vase; *κυφός*; *cupa*; g. *kufe*; d. *kuip*, *kop*; fr. *cuve*, *coupe*. v. Cave.

Cop, -e. v. Cut, Cap.

Copulate. v. Couple.

Cor-olla, -ona, -pus, -ridor, -sair, -tes, -useate. v. Career, Chord, Car, [Char, Ash.

Cord. v. Chord.

Cord-ate, -ial, Core. (ae-, eon-, dis-, re-.) v. Cardiac.

Coriaceous. v. Curry.

Cork, Cort-ical. **crt**, to encompass, to cut. Cfr. *cortex*; g. *kork*; d. *kurk*; sp. *corcho*. v. Chord.

Corn-ea, -er, -et. v. Cranium, Kernel.

Cosmetie, -ical. **ga′s**, to direct, to govern. Cfr. כשר to set right; [*κόσμος*.

Cosset. **cus**, to embrace; **gag**, to leap. Cfr. קשט a lamb.

Costal, (ae-cost.) v. Coast, Case.

Cot. **cotas**, a hut; **chattis**, a bed, or bier. Cfr. כתר to enclose; כחר to hide; *κεύθω*, *κοίτη*; g. *koth*; d. *kot*; w. *cwth*.

Cotton. **cat**, to surround, to cover. Cfr. כתן linen, flax; g. *kattun*; [d. *katoen*; it. *cotone*; fr. *coton*.

Cotyl-. v. Cut.

Cough. **capha**s, phlegm; **ca′s**, to cough. Cfr. קאה to vomit; pers. *chafa*; *χέω*, *χελώσσομαι*; *tussis*; g. *husten*.

Coulter. **hal**, to plough; **crt**, to cut. Cfr. *cultcr*; g. *kolter*; d. *kouter*; it. *coltro*; fr. *coutre*.

Coun-sel. **cun**, to advise; **gi′l**, to reflect, to repeat. Cfr. כון to ordain; שאל to ask; *consilium*; it. *consiglio*; pg. *conselho*; fr. *conseil*.

Count. (ac-, dis-, re-.) **gan**, to count (A.); **cu,s**, to speak. Cfr. [it. *contare*; fr. *conter*. v. Com-, Put.

Counter. v. Con-tra.

Counterpane. **cutapa**,, a goat-hair blanket.

Country. v. Con, Terra.

Coup. v. Champ.

Couple. v. Cable.

Courage. (ae-, dis-, en-.) v. Cardiac.

Cour-. v. Car.

Court. **crt**, to encompass. Cfr. *curia*; it. sp. pg. *corte*; fr. *cour*; [ags. *curt*. v. Chord.

Cousin. **cus**, to embrace; **cu,s**, to speak. Cfr. g. *kosen*; d. *kozen*; [fr. *cousin*.

Coutean. v. Cut-.

Cove-r-t. (al-.) **cuvra**,, a forest. v. Cave, Culvert.

Cow. **gaus**, a cow. Cfr. גית cattle; g. *kuh*; d. dan. *koe*; ags. *cu*.

Cowl. v. Cueullate.

Coy, Cozy. (ae-, de-.) **cus**, to embrace. Cfr. *κύσω*; fr. *ac-coisir*.

Crab. **crḃ**, to move, to hurt. Cfr. *κάραβος*; *carabus*; g. *krabbe*; d. *krab*.

Crack. **rudj**, to break. Cfr. רגע to break; *ῥηγνύω*, *ῥώξ*; g. *krachen*; d. *kraken*; it. *croccare*; fr. *craquer*, *roche*; sp. *rajar*; pg. *rachar*. v. Break.

-Cracy, -Crat-. **cratus**, power; **cṛ**, to do. Cfr. *κράτος*; *creo*.

Craft. **crp**, to be able. Cfr. g. sw. dan. *kraft*.

Crag. v. Crack.

Crane. **ghṛnn**, to take, to seize. Cfr. קרן power; *γέρανος*; *grus*; g. *krahn*; d. *kraan*.

Cranium. **ḉiras**, the head; **carṇ**, to pierce or bore. Cfr. קרן a cornet, a horn; *κάρα*, *κέρας*, *κρανίον*; *cranium*, *cer-ebrum*, *cervus*, *cornu*, *crinis*, *crista*; goth. *haurn*; g. *hirn*, *hirsch*; it. *cresta*;

Crank. v. Crook. [fr. *crête*. v. Horn.

Cranny. **carṇ**, to pierce, to cut. Cfr. *κρίνω*; *cerno*; fr. *cran*.

Crapulence. **ḉiras**, the head; **pal**, to go. Cfr. *κραιπάλη*; *crapula*.

-Cras-. **ḉvas**, to-morrow. [v. Craw.

Crash. **crſ**, to plough; **rad**, **crṭ**, to cut; **cṛ′**, to strike; **ghṛſ**, to rub, to grind. Cfr. חרש to plough; גרס to break in pieces; כרס to trample upon, to destroy; *χαράσσω*; *rado*; goth. *kriustan*; g. *kratzen*; d. *krassen*; it. *crosciare*; sp. *cruxir*; fr. *ecraser*, *gratter*.

Crasis. **cṛ′**, to throw, scatter, cover, fill. Cfr. גרה to mingle; קרס

-Crat. (auto-, demo-,) v. -Cracy. [a clasp; *κεράω*, *κράσις*.

Cratch. v. Crash.

Crate. **hṛ**, to take. Cfr. חרט a reticule; *κρατέω*; *crates*. v. Crash.

Crater. **crṭ**, to cut. Cfr. כרת to cut; *κρατήρ*. v. Crasis.

Craunch. **cru.tſ**, to make small. v. Crash.

Crave. **hrap**, to speak; **rabh**, to sound, to be pleased with. Cfr. רוב to plead a cause; *crepo*; goth. *hropyan*; d. *roepen*; ags. *crafian*, *hreopen*; w. *crevu*.

Craw, Crop. **cṛ′**, **ubh**, to fill. Cfr. כרך to swell; *κρύπτω*; *corpus*; g. *kropf*; d. *krop*; it. *groppe*; fr. *grouppe*.

Crawl. **il**, to go. v. Car, Creep.

Craze. v. Crash.

Creak. v Croak. [*crema*; fr. *crême*; g. *rahm*; d. *room*.

Cream. **cram**, **ṛ**, to go. Cfr. קרם to cover; *κρεμάω*; *cremor*; sp.

Crease. v. Crash, Crescent.

Create. **cṛ**, to do, to make. Cfr. ברה to prepare; *κραίνω*; *cresco*, *creo*; sp. pg. *criar*; fr. *creer*, *croitre*.

Cre-brous. **pṛ′**, **bhṛ′**, to fill. Cfr. *creber.*

Cred-it. (ac-, dis-.) v. Certain.

Creek. v. Crack. [*serpo ;* d. *kruipen ;* ags. *creopan.*

CREEP. **crap**, **srp**, **rep**, to go ; **crp**, to be weak. Cfr. $^{c}\varepsilon\rho\pi\omega$; *repo,*

-Creet. (dis-.) v. -Cern.

Cremation. **ɕra′**, to cook, to sweat ; **charaˢ**, warm ; **gharmaˢ**, heat. Cfr. כור a furnace ; *θέρμη ; cremo ;* goth. *varmja.* v. Carbon.

Cremor. v. Cream.

Cren-ate. v. Cranny.

Creo-sote. v. Carnal.

Crep-itate. **hrap**, to speak, to sound. v. Clap.

-Crepid. (de-.) v. Cripple.

Cresc-ent, -Cretion, -Crement. (ae-, in-.) **cṛ**, to make. v. Create.

Crest. v. Cranium.

Crevice. v. Carve.

Crib. v. Carp. [sp. *criba ;* fr. *crible.*

Cribble. **ɕvabhr**, to break, to perforate. Cfr. *cribro, cribellum ;*

Crime. **cṛ′**, to injure, to know. v. Certain.

Crimp. **ri.ph**, to injure. Cfr. רוף to break ; *rumpo ;* g. d. *krimpen.*

Crimson. **cṛ**, (**caromi**,) to make ; **ɕonaˢ**, crimson. v. Carmine.

Cringe, Cringle, Crinkle. v. Crook. [*pel.* v. Creep.

CRIPPLE. **crp**, to be weak. Cfr. כרף weak ; g. *krüppel ;* d. *kreu-*

Crisis, Crit-. v. Certain.

Cristate. v. Cranium.

-Croach. (ae-, en-.) v. Crook.

Croak. **cruɕ**, to cry out ; **grdȷ**, to growl. Cfr. כרז to call aloud ; *χράζω, χρώζω, χῆρυξ ; crocio ;* it. *crocciare ;* g. *krächzen ;* d. *kraaïjen.*

Crock. v. Crook, Ewer.

Croft. v. Carp-, Craw.

CRONE. **dȷi′rnaˢ**, old, decrepit. Cfr. *γέρων ;* ir. *criona.*

Crook. **cru.tf**, to bend. Cfr. כרך to wrap, to bind ; *κίρκος ; ruga ;*

Crop. v. Carp-, Craw. [goth. *hrugg ;* fr. *croc.*

Crosier, Cross. v. Crash, Croak.

Crotch, Croueh. v. Crook. [v. Clap.

Croup. **hrap**, to speak, to sound. Cfr. goth. *hropyan ;* ags. *hreopan.*

CROW. **ca′ravaˢ**, **charaˢ**, a crow ; **cruɕ**, to cry, to call. Cfr. *κορώνη, κόραξ ; cornix, corvus ;* og. *hraban ;* goth. *hruk ;* g. *krähe.* v.

Crown. v. Cor-ona. [Croak.

CRUD, Crude. **crud**, to eat, to be thick. Cfr. גרר to gnaw ; *rodo, crudus ;* sp. it. *crudo ;* fr. *crud.* [*crudelis ;* fr. *cruel.*

Cruel. **crudh**, to be angry ; **cru′raˢ**, (**crudhraˢ**?) cruel. Cfr. *κρούω ;*

Cruet. **ǧru**, to flow, to pour out. Cfr. ῥεω; *uro, cruor.*

Cruise, Crusade, Crush. v. Cross.

-Cruit. (re-.) v. Cresc-.

Cruller. v. Curl.

Cruse. v. Cruet, Ewer.

Crust, Crut. **crṭ**, to cut, to surround. Cfr. קרץ, כרת to cut; χρώς; *crusta;* g. *krúste;* d. *korst;* it. *crosta;* fr. *croûte.*

Crutch. v. Crook.

Cry. **gr′**, to sound; **crad**, to call, to weep. Cfr. כרז to call aloud; קרא to call; χράζω, χήρυξ; goth. *greitan;* ags. *grædan;* d. *krijten;* sp. pg. *gritar;* it. *gridare;* fr. *crier.*

Crypt. **gṛbh**, to take. Cfr. κρύπτω. v. Carp-.

Cub-. v. Cumb-.

Cuckoo. **cu**, to sound, to complain; **cocilaˢ**, the cuckoo. Cfr. κόκκυξ; *cuculus;* fr. *coucou;* g. *kuckuck;* d. *koekoek;* sp. *cuco.*

Cucullate. **tfil**, to clothe; **cul**, to collect. Cfr. כלא to contain; κολεός; *cuculus;* sp. *cogulla;* pg. *cogula;* ags. *cugele.*

Cud. **cha′d, cuḍ**, to eat. Cfr. κῆδος.

Cucumber. (*cucumis.*) **sucha′ǧa**, a cucumber.

Cuddle. **cuḍ**, to collect. v. Caddis. [κόπτω; pers. *kafa.* v. Cab.

Cuff. **cup**, to be angry; **copayati**, he strikes. Cfr. נקף to strike;

Cull. v. Cell, Coil.

Culm. v. Calamus. [*columen.*

Culminate. **tful**, to erect; **ǧal, dǰal**, to cover. Cfr. *culmen, columna,*

Culpable. **crp.** to be weak. Cfr. כרף weak; *culpa.* v. Clavate.

Culter. v. Coulter.

Cultivate. **hal**, to plough. v. Coil.

Culver. **calaravaˢ**, a pigeon.

Culverin. fr. *couleuvrine;* it. *colubrina.* v. Coluber.

Culvert. **cul**, to collect, to flow continuously; **cu′l**, to enclose, to cover; **vṛ**, (**vṛta,**) to cover. v. Cull.

Cumb-ent, -er. (ac-, en-, in-, re-, suc-.) **cu,b, cub**, to cover, to prostrate. Cfr. כבד heavy; כבה to extinguish; כבש to cover; κύβος; *cubo, cumbo.*

Cumulate. (ac-.) **ǧvi**, to swell; **mal**, to hold. v. Con. Cfr. κυέω, κῦμα; *cumulo;* it. *cumulare;* fr. *combler, cumuler.*

Cuneal. v. Coin.

Cunning. v. Can.

Cup. v. Cave, Coop.

Curd. v. Crude.

Cure. (ac-curate.) v. Care.

Curiality. ϱu´raˢ, a hero. Cfr. *κῦρος, κύριος; curia.*

Curl. curalaˢ, a curl. Cfr. d. *krullen;* it. *crollare;* fr. *crouler.*

Cur-rent, -riele, -sive, -sory. v. Car. [*coriarius;* fr. *corroyer.*

Curry. chur, to cut, to scrape. Cfr. קרוּר a curry-comb; *corium,*

Curse. cruϱ, to cry out. Cfr. קרא to call; ags. *cursian.*

Curt. dȷ̇r, to make short or low; cṛt, to cut. Cfr. *κείρω; curtus;*

Curt-ain, -al, -ate. v. Cork. [g. *kurz;* ags. *sceort.*

Curule. v. Car.

Curve. v. Career.

-Cuse, (ac-, ex-.) v. Ac-cost.

Cuss-ion. (con-, dis-.) caſ, to strike, to kill. Cfr. *con-cussio.*

Custody. v. Case, Chaste.

Cut, -icle. cuṭ, to cut, to despise. Cfr. קוּט to cut off, to disdain; *κόπτω; cædo, cudo, cutis, acutus.* v. Cuttle, Escutcheon.

Cuttle. tſhad, tſuḍ, to cover, to hide; cuḍ, to collect; caṭ, to rain, to surround, to cover. Cfr. כחד to hide; כתר to enclose; *κυτός; cutis;* ags. *cudele.*

Cycle. cuc, to take; ϱa´ch, to embrace; catſ, to bind; cutſ, to curve. Cfr. כּוך a cave; *κύκλος; cyclus.*

Cylinder. cal, to throw or cast; cul, to flow homogeneously. Cfr. גלל to roll; *κυλίω, κύλινδρος; cylindrus;* sp. it. *cilindro;* fr. *cylindre.*

Cyma. cu´ma, a lake, a pool, a pond. Cfr. *κῦμα.* [it. *cembalo.*

Cymbals. } ϱamb, to move, to join. Cfr. *κύμβαλον; cymbalum;*

Cymbi-form. } camb, ϱamb, to go, to move; cambuˢ, a shell; cumbhaˢ, a small water-jar. Cfr. *κύμβος; cymba.*

Cyn-anche, -ic. ϱvan, (ϱun,) a dog. Cfr. *κύων; canis, cynicus;* goth. *hunds.* [g. *kirche;* d. *kerk;* dan. *kirke;* ags. *circe.*

Cyrio-. ϱu´raˢ, a hero; ϱu´r, to be brave. Cfr. *κύριος, κυριαχός;*

Cyst. v. Case.

Czar. sur, to possess supreme power. v. Cyrio-.

Dab, Daff, Daft, Deaf. da.b, dabh, to throw, to heap up; tup, to strike. Cfr. דב dung; דפק to beat violently; טבל to dip; *τύπτω; in-duo;* fr. *dauber, etouffer;* goth. *daub;* g. *taub;* d. *doof.*

Dactyl. v. Digit.

Dag-ger. dagh, tudȷ̇, to strike, to kill. Cfr. דכה, דוך to beat, to bruise; דקר he pierced; *δαΐζω; δαίκτήρ;* g. d. *degen;* it. *daga;* pg. *adaga;* fr. *dague.*

Dainty. dantaˢ, a tooth. Cfr. *ὀδόντ-; dens;* fr. *dent;* it. pg. *dente;* goth. *tunthus;* g. *zahn;* ags. *toth.*

Dairy. duh, to milk. Cfr. russ. *doyu.*

Daisy. v. Day.

DALE, Deal, Delve, Dole. **dal**, to cut, to divide, to pierce. Cfr. תלע to cleave; *θάλ-ασσα*; *dolo*; goth. *dails, dal-*; g. *theil, thal*; d. dan. sw. *dal*; ags. *dæl, dal, delfan*.

DAM, (a-damant.) **dam**, to subdue; **ḍa.b**, to heap up; **dama**ˢ, mud. Cfr. דמה to destroy; אטם to stop; *δαμάω, δάμαρ, ᾽α-δάμας*; *domo, domin-us, -a*; goth. *domjan*; g. *dämmen, damm*; d. *dammen, dam, doemen*.

DAME. **dam**, a wife. Cfr. sp. pg. it. *dama*; fr. *dame*. v. Dam.

Damp. **tim**, to be moist; **tip**, to drop. Cfr. דמע a tear, liquor; טוף to overflow; *᾽ατμός*; *δύπτω*; g. *dampf*; d. dan. *damp*; it. *tanfo*.

Dandle. **ta.ḍ** to beat. Cfr. *tundo*; g. *tändeln*; it. *dondolare*; fr.

Danger. **tu.ḍȷ**, to strike, to be strong, to live. [*dandiner*.

Dangle. **ta.g**, to shake, to tremble. Cfr. dan. *dingler*.

Dapifer. **ḍap**, to heap up. Cfr. *δαψιλής, δεῖπνον*; *dapes*.

DARE, (Durst.) **dhrſ**, to dare, to be bold. Cfr. *ζαρρέω*; goth. *ga-daursan*; g. *dürfen*; d. *darren, durven*; ags. *durran*.

Darling. v. Dear.

Darn. **dhr**, to hold. Cfr. תרא a chain; fr. *darne*; w. *darn*.

Dart. **tard, trḍ, tu´r, dhu´r**, to strike, to kill; **da´ru**, wood. Cfr. טרד to cast out; *δόρυ*; *trudo*; it. sp. pg. *dardo*; fr. *dard*.

Dash. **das**, to throw; **da´s**, to strike, to kill. [*data*; fr. *date*.

Data, Date. **da´**, (**datta**,) to give. Cfr. *δίδωμι*; *do, datum*; it. sp.

DATURA. **dhattu´ra**ˢ, the thorn-apple.

Daub. v. Dab. [*dauhtar*; g. *tochter*; d. *dochter*; ags. *dohtar*.

DAUGHTER. **duhitr**, daughter. Cfr. *θύγατηρ*; pers. *dochtar*; goth.

DAUNT. **dam**, (**da´nta**,) to subdue. v. Dam.

Dawn, Day, Dazzle. **dina**ˢ, **diva**, **dyu**, day; **dah**, to burn. Cfr. *δῖος*; *dies, divum, diu*; goth. *dags*; g. *tag-en*; d. *dag-en*; ags. *dæg*; it. *giorno*; fr. *jour*.

De-. **di´**, to perish, to destroy; **da´**, to divide.

Deacon. **can**, to go, to love. Cfr. קנא zealous; *κονέω, διάκονος*; *diaconus*; it. sp. *diacono*.

Dead. **tuḍ**, to strike, to kill. Cfr. g. *todt*; d. *dood*.

Deaf. v. Dab.

DEAL. v. Dale.

Dean. v. Deacon, Dec-.

Dear. **ḍr**, to revere, to respect; **dhr**, to maintain. Cfr. דרש to care

Death. v. Dead. [for; *θέρω*; g. *theuer*; d. *duur*; ags. *deor*.

De-bacle. **bha.ḍȷ**, (**bhactva´**,) to break. [sp. pg. *debate*; fr. *debat*.

De-bate. **bhat**, (Caus.) to speak. Cfr. בטא to speak; *φάτις*; *fatus*;

DE-BILITY. **durbala**ˢ, weak. Cfr. *debilis;* sp. *debil;* it. fr. *debile.* v. Ability. [*devoir;* sp. *deber.*

Debit, Debt. **div**, to traffic. Cfr. *deb-eo, -itum;* it. *dovere;* fr.

DEC-ade, -imal, &c. **daça**n, **daçama**ˢ, tenth. Cfr. *δέκα; decem;* fr. *dix, decade;* goth. *tig, taihun;* g. *zehn;* ags. *tyn, teighthian.*

Decay. v. Cadence.

Deck. **tac, tidJ**, to sustain; **tvatſ**, to cover. Cfr. *τέγος; tego, tectum;* g. *dach, decken;* d. *dekken, dak;* ags. *theccan, thac.*

Decorous. **yaça**s, fame, praise, splendor. Cfr. *δοκ-, δόξα; dec-, dig-.*

Decree. v. -Cern. [v. Dic-.

DEDITION, deed. **dha′**, to place; **dadh**, to give, to perform, to possess. Cfr. *τίθημι, δίδωμι;* goth. *ga-deds;* g. *that;* d. dan. *daad;*

Deep. v. Dip. [ags. *dæd.*

Defy. fr. *defier.* v. Faith.

Degree. v. Grade.

Dei-fy. **deva**ˢ, a deity. Cfr. *θεός; deus;* fr. *dieu;* it. *dio.*

Deipno-. v. Dapifer.

Dele-ble. **lu′**, to cut off, to destroy. Cfr. עלה to cut off; *λύω; deleo.*

Delft, Delve. v. Dale.

Delic-ate, -ious, Delight. v. Like.

DELL. v. Dale.

Deluge. v. Lave. Cfr. *diluo, diluvium;* it. sp. *diluvio;* fr. *deluge.*

DEMI-. **dvi**, two. Cfr. *δι-, δίς; di-midium;* fr. *demi.* v. Semi, Medium. [*-uis;* it. *tana;* fr. *taniere;* ags. *den.*

Den. **tan**, to extend, to expand. Cfr. טנר a rock; *τείνω; ten-do,*

Dendroid. (*δένδρον.*) v. Tree.

DENT-AL. **danta**ˢ, a tooth. v. Dainty.

Dermal. **dvr**, to cover; **dr′**, to tear, to rend. Cfr. *δέρμα, δέρω.*

Derrick. **dṛ, dhṛ**, to hold.

Des-ery. v. Certain. [*desidero;* fr. *desirer;* it. *desirare.* v. Seat.

Desiderate, Desire. **sad**, to sit, to despond, to encounter. Cfr.

Desk. v. Dise. [*poto;* fr. *despote.* v. Potent.

DESPOT. **deç**, a region; **patiˢ**, a master. Cfr. *δεσπότης;* it. sp. *des-*

DESTINY. **diſta**,, destiny. Cfr. *destino;* fr. *destin.*

Destroy. (*destruo.*) v. Strew.

Desultory. (*desilio.*) v. Salient.

DETER. **dṛ′**, (Caus.) to terrify, to deter. Cfr. *ταρ-άσσω; de-terreo.*

De-tri-ment, -tus. v. Tear.

DEUCE, Deutero-, (Bis, Bin-.) **dva′**, **dvau**, **dviˢ**, **dvitaya**,, two; **dviti′ya**ˢ, second. Cfr. בנ to divide, to separate; תמ a twin;

βινέω, δέυτερος, δύο, δίς, δίδυμος; binus, duo; goth. *tuz, tvai;* g. *zwei;* nl. d. *twe;* ags. *twâ;* fr. *deux.*

Devil. **di′**, (**di′yati,**) to destroy; **bal**, to strike, to kill. Cfr. *διάβολος; diabolus;* g. *teufel;* d. *duivel;* fr. *diable;* it. *diavolo.*

Dew. **dha′v**, to wash. דוח to wash; *δεύω, δέφω;* g. *thau;* d. *dauw;* ags. *deaw.*

Dexter. **dacſaʂ**, dextrous. Cfr. *δεξιός; dexter;* goth. *taihsus.*

Di-. v. De-.

Diabolic. v. Devil.

Dia-chylum. **cul**, to flow homogeneously. Cfr. *χυλός.*

Diaconal. v. Deacon.

Dial, Diary. v. Dawn.

Diamond. v. Dam. Cfr. *'αδάμας, -αντος;* g. d. fr. *diamant;* it. sp. [*diamante.*

Dic-. (apo-, ab-, de-, e-, in-, pre-, &c.) **diʂ**, to give, to point out, to order, to narrate. Cfr. דוק to observe; *δείκ-, δίκη, δάκτυλος, δοκέω, δόγμα, δόξα; τάσσω, ταγός; dico, dux, disco, digitus, disertus, in-dex;* fr. *dicter, doigt;* goth. *taikns;* g. *zeichen;* d. *teeken.*

Dicker. v. Dec-.

Did. v. Dedition.

Didactic, Didascalic. v. Disc-.

Die. **di′**, to perish; **day**, to kill.

Dif-find, -fission. **bhid**, to cleave. Cfr. בד to separate; *dif-findo.*

Digit. v. Dic-, Dec-. Cfr. *δάκτυλος; digitus;* goth. *taiho;* g. *zehe.*

Dignity. v. Decorous.

Di-lute, -luvial. v. Deluge.

Dim. **tamas**, obscurity; **dhu′maʂ**, smoke. Cfr. טמא he was defiled; טמר to conceal; *tenebræ;* goth. *dumbs;* dan. *dum;* g. *dün-kel, stumm;* ir. *teim;* ags. ofrs. *dim.* v. Damp.

Din. **dhan**, to sound; **dịndi**, din. Cfr. רון strife; *τόνος; tinnio, tono;* ags. *dyn.* v. Tone.

Dine. v. Dawn. fr. *diner;* ags. *dynan.* [*dencgan.*

Ding. **dagh, tuˌdɟ**, to strike. Cfr. דכה to break or bruise; ags.

Dip. **dip**, to throw, to cast. Cfr. *δύπτω;* goth. *daupjan, diups;* g. *tupfen, tief;* d. *doopen;* it. *tuffare;* ags. *dippan.* v. Dab.

Diploma. v. Deuce, Couple.

Dire. **dṛ′**, (Caus.) to terrify; **dị′**, to fly. Cfr. *δέος; divus.* v. Deter.

Dis-. **das**, to throw.

Disard. v. Dic-. [*δίσκος; discus;* sp. it. *disco;* fr. *disque.*

Disc, Dish. **das**, to throw; **cas**, to go, to cut. Cfr. טס a thin plate;

Disc-, Disert. v. Dic-.

Dishevel. v. Cap. Cephalic.

Distinguish. v. Sting. [*detto.* v. Die-.

Ditto. **tatha´**, (A.) thus, so; **diç**, to point out, to narrate. Cfr. it.

Diu-. v. Dawn.

Dive. v. Dip. [fr. *divin.*

DIVINE. **deva**ᵊ, a god; **divya**,, divine. Cfr. *θεός, δῖος; deus, divinus;*

Divoree. (*divortium.*) v. Vert. [טשה stockings.

Dizen. **ta¸s**, to adorn; **dhu´s**, to make beautiful; **da´s**, to give. Cfr.

Djerrid. **dȷu´r**, to kill.

Do. **vi-dha´**, **a´-dha´**, to do.

Doe-ile, -imacy, -tor. v. Dic-.

Dodd. **tud**, to cut.

Dodge, Dog. **da¸gh**, to avoid, to guard, to hurt or kill; **da¸ç**, to bite. Cfr. רגה to break or bruise; *δάκνω; lac-ero;* goth. *tahja;*

Dogma. v. Dic-. [fr. *dogue;* d. *dog.* v. Attaek.

DOLE. v. Dale.

Dolabriform. **do**, to eut off; **lu´**, to cut. Cfr. *dolo, dolabra.* v. Dale.

Dole, Doole, Dolor-, Dolt. **tal**, **tval**, to be disturbed by fear, anxiety, &c.; **du´**, to grieve. to be afflicted. Cfr. טלמ to grieve; *doleo, dolor;* goth. *dvals.*

-Dom, Domain, Domin-, Domit-. v. Dam, Dome.

Dome. **da¸bh**, to collect, to heap up; **dha´man**, a house, dignity. Cfr. דבך a wall or building; *δέμω, δῶμα; domus;* goth. *doms, timbrijan;* fr. *dôme;* it. *domo;* d. *dom.*

DON-. **da´**, **da´s**, to give; **da´na**,, a gift. Cfr. *δάνος, δίδωμι, δόσις; dono;* fr. *donner, dose.*

Doom. v. Dam.

DOOR. **dva´r**, (**du´r**,) a door, a passage; **dvṛ**, to cover. Cfr. תרע a gate; תרמ the beams; *θύρα; foris;* goth. *daur;* g. *thor, thür;* d. *deur.* [*dorée*

Dorado. **dru´**, gold. Cfr. דרך a draehm of gold; sp. *dorado;* fr.

DOR-mant. **drai**, to sleep. Cfr. טרח fatigue; *δαρθάνω; dormio;* fr. *dormir;* g. *traum;* d. *droom.*

Dose, Dotal. (anee-, anti-.) v. Don-.

Dot. **tat**, to strike or beat.

DOUBLE. **dviᵊ**, two; **puˈl**, to collect. Cfr. *διπλόος; duplus;* g. *doppelt;* d. *dubbel;* it. *doppio;* sp. *doble;* fr. *double.*

Doubt. **dviᵊ**, two; **path**, **pad**, to go. Cfr. *du-bito;* sp. *dudar;* it. *dubitare;* fr. *douter;* g. *zwei-feln;* d. *twijfelen.*

Douche, Douse. **tudȷ**, to strike. v. Dash.

Dough. **dih**, to smear, to increase, to accumulate. Cfr. ags. *dah;* g. *teig;* d. *deeg, dijen.*

Dove. **dev**, to complain, to lament. Cfr. דבב to murmur; goth. *dubo*; g. *taube*; d. *duif*; ags. *dufa*.

Dower. **da´ra´**, a wife; **da´riˢ**, cutting, dividing.

Dox-. v. Dic-, Decorous.

Dr-. (abble, -ip, -op.) **dru**, to flow, to run. Cfr. *δρέμω*; goth. *truf*.

Dr-achma. **dhṛ**, to hold. Cfr. דרך a drachm of gold; *δρ-άσσω*,

Drab. v. Trapes. [*δραχμή*; fr. *dragme*; it. *drama*.

Drag. **dhradJ**, **trac**, to go; **dra´gh**, to be wearied, to be long; (Caus.) to extend, to increase; **dhṛ**, to hold, to carry. Cfr. טרח fatigue; *τρέχω*; *traho*; goth. ags. *dragan*; g. *tragen*; d. *dragen*; fr.

Dragoman. **tarc**, to speak, to discuss. [*traire*.

Dragon. **drḳ**, to see. Cfr. דרש to search, to inquire; *δέρκω*, *δράκων*; *draco*; g. *drache*; d. *draak*; fr. *dragon*.

Dragoon. **dra´**, to flee; **dʒanaˢ**, a man. Cfr. *δραμεῖν*; goth. *driugan*; it. *dragone*; fr. sp. *dragon*.

Dram. v. Drachma. [thresh; תרך to cast out; *δραστικός*.

Drastic. **drſ**, to conquer, to overcome. Cfr. דרך to tread upon, to

Draught, Draw, Dray. v. Drag.

Drave. v. Drop.

Dread. **dṛ´**, to fear; **darad**, terror. Cfr. דרא loathing; *terreo*;

Dream. v. Dormant, Dragoon. [ags. *dreorig*; g. *traurig*.

Drear. v. Dread.

Dredge. v. Drag.

Dregs. **dra´ch**, to be dry. Cfr. *τρύξ*, *τρυγία*, *τρυγέω*, *θέρω*; *torreo*, *tergo*; g. *trocken*, *dürr*; d. *droog*, *dor*; ags. *drig*.

Dress. **ra´dJ**, to shine, to govern. Cfr. *rego*, *dirigo*; it. *dirizzare*,

Drib-ble. v. Drop. [*diritto*; fr. *dresser*, *droit*.

Drift, Drive. **turv**, **thurv**, **durv**, **dhurv**, **trup**, to strike. Cfr. דרב a goad; טרף to tear, to prey; *δρύπτω*, *τρίβω*; goth. *dreiban*;

Drill. v. Thirl. [g. *treiben*, *treffen*; d. *drijven*; ags. *drifan*.

Dromedary. **dram**, to run. Cfr. *δρομάς*; *dromas*; sp. pg. it. *dromedario*.

Drone. **drai**, to sleep; **druṇ**, to injure; **druṇaˢ**, a bee; **dhraṇ**, to sound. Cfr. goth. *drunjus*; ags. *dræn*; g. *drone*, *drönen*; it. *trono*.

Drop, Drip, Droop. **dru**, (**dravati**,) to flow. Cfr. דרק to sprinkle; *δρόσος*; *drupæ*; g. *tropfen*; d. *droppen*; ags. *dropan*.

Dropsy. *ʷυδρωψ*; *hydrops*. v. Hydra.

Droso-meter. v. Drop, Roscid.

Drought. v. Dregs.

Drowse. v. Dormant.

Drub. v. Drift.

Drudge. v. Drag.

Drug. v. Dregs. [*dryades.*

Druid, Dryad. **da´ru**ˢ, wood; **druma**ˢ, a tree. Cfr. *δρῦς*; *druidæ,*

Dry. v. Dregs.

Dual, Duel. v. Deuce.

Dub. v. Dab.

Due-. (ad-, con-, de-, e-, pro-, re-.) Ducat, Duchy. v. Die-.

Dudgeon. v. Dag-ger.

Due. v. Debit. (sub-due. v. Tame.)

Dug. **duh,** (**dugdhe,**) to milk. Webster refers this word to the root of *digitus.* v. Die-.

Dule-. **gula**ˢ, raw sugar. Cfr. *γλυκύς*; *dulcis.*

Dumb, Dump. **dam,** to subdue; **da¸bh,** to deceive, to injure. Cfr. דומ silence; goth. *dumbs;* ags. *dumb;* g. *stumm, dumm;* d. *dom.* v. Dam.

Dung. **da¸gh,** to quit or abandon.

Dungeon. **ta¸dJ,** to shrink, or contract.

Duo-, Duple. v. Deuce, Double.

Dur-. **dhṛ,** to hold, to detain; **dhṛ´,** to grow old; **du´ra**ˢ, distant; **dur, dus,** difficult, bad. Cfr. דור an age; *δυς-*; *duro, durus, -turnus;* fr. *dur, -er.*

Durst. v. Dare.

Dust. **tusta¸,** dust. Cfr. דשן dust and ashes; טוש blemished; nl. d. ags. *dust.*

Dys-. v. Dur-.

Each. **eca**ˢ, one. Cfr. ir. *each.* v. Aec.

Ead-, Ed-. **i´ḍ,** to praise, to celebrate. [*gior.*

Eager. **gur,** to make an effort. Cfr. *acer;* it. *agro;* fr. *aigre;* d.

Eagle. **a´ɢu,** quickly. Cfr. *ʾωκύς*; *aq-uila, ac-cipiter;* sp. *aquila;* fr. *aigle.*

Ear. v. Aud-ible.

Earn-est. **gur,** (**gu´rna¸,**) to make an effort. Cfr. sw. g. *gern;* ags. *georn;* g. d. *ernst.*

Ease. **a´s,** to sit. Cfr. אכר a pillow; *ʾησ-ται*; *otium, esseda;* goth. *azetaba;* ags. *æth, eadhe;* it. *agio;* fr. *aise.*

East. **uf,** to shine, to burn; **ufa**ˢ, dawn. Cfr. אש fire; *εώς*; *aur-ora;* g. *ost;* d. *oost.*

Eat. **ad,** to eat. Cfr. ער the mouth; *ʾεδω*; *edo;* goth. *at, itan;* ags. *ytan;* g. *essen, etzen;* d. *eten, etsen.*

Eave. v. Over.

Ebb. v. Ab-.

Ebriety. (*ebrietas.*) **pṛ′, bhṛ,** to fill, to satisfy.

Ec-. **eʃ,** to go. Cfr. *ἐκ, ἐξ; ex.*

Echelon. **tʃel, ɢal,** to go. Cfr. *scala;* sp. *escala.* v. Celer-.

Echo. **cu, chu,** to sound; **vatʃ,** to speak. Cfr. קול sound; *ἠχέω; echo.*

Ec-lipse. **lep,** to go. Cfr. *ἔκ-λειψις; eclipsis.*

Eco-nomy, Ecu-menic. **ocaˢ, veɢaˢ,** a house. Cfr. *οἶκο-νομία; œconomia, vicus;* goth. *veihs;* d. *wik;* ags. *wic.*

Edda. v. Ode.

Eddy, Edematous. **hud,** to go, to collect, to be sunk. Cfr. *οἰδέω.*

Eden. **dhan,** to produce; **dhana,,** property; **dhanyaˢ,** fortunate. Cfr. עדן pleasure, delight.

Edge. **tidʒ,** to whet, to sharpen; **utʃh,** to finish, to bind. Cfr. אכל a knife; *ἀχή; acus, acies;* ags. *ecg;* sw. *egg;* g. *ecke;* fr. *aigu.*

Edifice. **adhi,** over, upon; **adhiva′saˢ,** an abode. Cfr. *ædes, ædificium.*

Eft. v. Aft-.

Egg. **anda,,** an egg; **ava,** from, out of. Cfr. *ᾠόν; ovum;* g. d. *ei;* ags. *æg;* dan. *eg.* v. Ec-.

Ego-tism. **aham,** I. Cfr. *ἐγών; ego.*

Egregious. v. Greg-.

Egyptian. **gup,** to guard or protect. (Webster.)

Eight. **aʃtan,** eight. Cfr. *ὀκτώ; octo;* goth. *ahtau;* g. *acht;* d. *agt;* ags. *eahta;* it. *otto.*

Eisen-rahm. **ayas,** iron. Cfr. g. *eisen-rahm.* v. Cream.

Either. ags. *ægther.* v. Ace, Other.

Eke. **yudʒ,** to join; **u′h,** to collect; **utʃ,** to be gathered together. Cfr. עקר to bind or tie together; *ac;* goth. *auk;* ags. *eacan;* g. *auch;* d. *ook.* v. Auction.

Elastic. **lastacaˢ,** the middle of a bow, (from **laˢ,** to grasp;) **luṭ,** to resist, to strike against. Cfr. it. sp. *elastico;* fr. *elastique.*

Elephant. **pi′luˢ,** an elephant. Cfr. פיל an elephant; *ἐλέφας.*

El-ement, Elf. **al,** to suffice, to be competent; **il,** to go, to send.

El-lipse, E-lope. v. Ec-lipse.

Else. ags. *elles.* v. Alias.

Ember. ags. *emb-ren, ymb-ryne.* v. Am-, Run.

Em-blem, -bolism. v. Balister.

Embrocation. **vṛʃ,** to rain. Cfr. *ἐμ-βρέχω.*

Embryo. **bhruṇaˢ,** the fœtus. Cfr. *ἔμβρυον.* v. Bear.

Emerald. **maracataˢ,** emerald. Cfr. *μάραγδος, σμάραγδος; smaragdus;* g. d. dan. *smaragd;* it. *smeraldo;* sp. pg. *esmeralda;* fr. *emeraude.*

Emetic. v. Vomit.

Em-peror, -pire, -porium. **pur**, to lead, to go, a city; **pṛ́**, to guard, to protect. Cfr. פרנס a governor; *πορεύω*; *im-perator*; it. *imperadore*; fr. *empereur*; ags. *faran*.

Em-piric. v. Peirastic.

E-munctory. **ma.dȷ**, to clean, to purify. Cfr. *emungo*.

En-. v. In, A, An.

Eneeinte. v. Cincture.

En-comium. **cam**, to desire, to love; **tʃam**, to eat. Cfr. *κῶμος*, *ἐγκώμιον*. v. Comity.

END. **antaˢ**, the end. Cfr. goth. *andeis*; g. *ende*.

En-deictic, -dict. v. Die-.

Enemy. *in-imicus*; it. *nemico*; sp. *enemigo*; fr. *ennemi*. v. Amability.

EN-ERGY. **ardȷ**, to work, to make. Cfr. *ἔργω*; *urgo*.

En-gine. **dȷan**, to produce. Cfr. גנם lineage; *γεννάω*; *gen-ero*, *ingenium*; sp. *ingenio*; fr. *engin*.

Enigma. **niǧ**, to meditate. Cfr. *αἰνίσσομαι*, *αἴνιγμα*.

En-omoty. *ἐν-ωμοτία*. v. Amen.

Ensi-form. **asi**, a sword.

Ensue. v. Seek.

ENTER, Entrails, Entry. **antar**, within, **antra**,, an entrail. Cfr. *ἔντερα*; *inter*, *intro*, *venter*; sp. *entrar*; it. *entrare*; fr. *entrer*.

En-viron. **vṛ**, to cover, to surround. Cfr. sp. *birar*; fr. *virer*, *environner*.

Envy. *invideo*; fr. *envier*. v. Vid-.

EP, EPI. (*ἐπί*.) **upa**, **api**, **abhi**, near, beside, with.

Ephod. אפר. v. Band.

Ep-ic. v. Fable.

Epicede. *ἐπικήδειον*. **cad**, to weep. Cfr. קוט to grieve.

Epulation. *epulæ*, (*edi-pulæ? Ainsworth.*) v. Eat, Full.

Equal. **evaˌ**, as, like; **ecaˢ**, one, the same; **vifu**, equally. Cfr. אין thus; *ἴσος*, *ἔικω*; *æquus*; goth. *iba*, *ibns*; g. *eben*.

EQU-erry, -estrian. **aǧvaˢ**, a horse. Cfr. *ἵππος*; *equus*; fr. *ecuyer*, *ecurie*. v. Esquire.

Era. **iˊr**, (**air-**,) to go. Cfr. *æra*; sp. *era*. v. Err.

ERGO. **ardȷ**, to make; **uˊrdȷaˢ**, power. Cfr. *ἔργω*; *ergo*, *ex-erceo*, *-itus*; it. *esercizio*; fr. *exercise*. v. Work.

-Erne. v. Urn.

ERR. **iˊr**, **ṛ**, to go. Cfr. ירט to pervert; *ἐρρεῖν*; *erro*; goth. *airzis*; g. *irre*; it. *errare*; fr. *errer*.

Erruncate, (ab-, av-.) *averrunco.* **luntſ**, to pluck up.

Escalade. v. Echelon.

Escape. v. Scamper, Shaft.

Eschar. v. Carbon.

Escheat. fr. *echeoir.* v. Chute.

Escutcheon, **scu**, to cover. Cfr. *σκύτος*; *cutis, scutum*; it. *scudo*; sp. *escudo*; fr. *ecu-sson*; ags. *scylan, scyld*; sw. *skyla*; g. d. *schild.* v. Shade. [cutcheon.

Esquire. fr. *ecuyer*; sp. *escudero*; it. *scudiere.* v. Equerry, Es-

Essence. **as**, (**asti**,) to be. Cfr. שה׳ existence; *ἐστί*; *esse-ntia*; goth. g. *ist*; it. *essenza*; fr. *essence.*

Establish. **stu´p**, to heap up, to erect; **sta¸bh**, to fix, to support. Cfr. צב׳ to place; *stabilio*; it. *stabilire*; fr. *etablir.*

Estate. **stha´**, to stand. Cfr. *στατός*; *status*; g. d. *staat*; it. *stato*; sp. *estado*; fr. *etat.*

Estival, Estuary. v. Ash.

Etch. g. *etzen*; d. *etsen.* v. Eat.

Eternal. *æternus*, (*ævi-turnus.*) fr. *eternel.* v. Aeon, Dur-.

Ether. **iddhaˢ**, shining, clear. Cfr. *αἴθ-ω, -ήρ*; *æther*; ags. *wæder*; g. *wetter*; d. *weder.*

Eth-ic, -nic. **edh**, to grow or increase. Cfr. *ἔθω, ἔθνος*; *ethicus, -nicus*; g. *heide.* v. Use.

Ethiop. *Αἰθίοψ.* **indh**, to kindle. Cfr. *αἴθω*; *æstus.*

Etio-logy. **yat**, to make, to strive. Cfr. צא׳ to produce; *αἰτία.*

Etymo-logy. **satyaˢ**, true. Cfr. *ἔτυμος.*

Eu-. **su**, good, easy, well. Cfr. *εὖ.*

Euch-ology, Euc-tical. **ya´tſ**, to ask. Cfr. *εὔχομαι.* [Equal, Ab-.

Even. **iva**, **evaˌ**, even, so, as. Cfr. goth. *iba, ibns*; g. *eben.* v.

Ever. (ags. *efre.*) v. Aeon, Hora-.

Evil. **a´vilaˢ**, foul, turbid; **abalaˢ**, weak, feeble; **vya´laˢ**, wicked, villanous. Cfr. נבל foul, vile; goth. *ubils*; g. *übel*; d. *euvel*; ags. *efel.* [*εἴκω*; *e-vito.*

Evitable. **vitt**, to abandon; **vitſ**, to separate. Cfr. בד to separate; d. *ooi*; ags. *eowa.*

Ewe. **aviˢ**, a sheep. Cfr. *οἶς*; *ovis*; goth. *avis-ti*; sp. *obeja*;

Ewer. **hvr**, to bend, to curve. Cfr. goth. *hrugg*; ags. *hwer*; g.

Ex-. v. Ec-. [*krug*; d. *kroeg*; fr. *cruche.*

Examine. **ɢam**, to be tranquil, to inspect. Cfr. שמן gross, stupid; שמר to observe; *σῆμα*; *exam-en, -ino*; pg. *enxame*; fr. *essaim.*

Example. v. Sample.

Execute. v. Seek.

Excellent. **ucſa′laς**, excellent. (A.)

Exegesis. v. Act.

Exercise, Exergue. v. Ergo.

Exhaust, **hṛ**, to seize. Cfr. *ʾαρύω*; *haurio.*

Exile. v. Sally.

Exist. v. Essence, Estate.

EXODUS. **hoḍ**, to go. Cfr. עָרָה to pass by; *ʿοδός.*

EXPATIATE. **paṭ**, to go. Cfr. פטר to depart; *πετάω*; *pateo, expatior.*

Expedite. v. Speed.

Exper-. **pṛ**, to be busy, to labor. Cfr. פאר power; *πεῖρα*; *experior.*

Extra. v. Con-tra-ry.

Exult. v. Salt-.

EYE. **acſi**, (**nayana**,,) the eye. Cfr. עין; *ʷοσσε, ʷοχχος*; *oculus*; goth. *augo*; g. *auge*; d. *oog*; it. *occhio*; sp. *ojo*; fr. *œil*; dan. *öye*; ags. *eag.*

Fable. **dJap, hlap**, to speak; **a¸b**, to sound. Cfr. דבא speech; *ʷεπω*; *fabulor*; it. *favola*; sp. *hablar*; fr. *fable.* v. Fac-und.

Fac-. **bhu′**, to be, (Caus. **bha′v-**.) Cfr. *ποιέω, φύω*; *facio*; fr. *façon, faire, faisable.*

Fac-und, Face. **vatſ, bha′ſ**, to speak; **vactra**,, the mouth or face; **vaſc**, to see. Cfr. *φάζω, φάω, φάμα*; *fama, facundus, facies, fatum, fabula, facetus, facies.*

Fadge, Fagot. **pi¸dJ**, to join; **pas, paç**, to bind. Cfr. *πήγω*; *fascia, pango, figo*; goth. *fahan, faskja*; ags. *fœgen, fengan*; g. [*fangen.*

Fæces. v. Fetid.

Fail. **il**, to go; **vi-li′**, to lie down, to perish; **la¸b, ava-la¸b**, to fall; **phal**, to divide; **sphal**, to tremble. Cfr. נפל to fail, to fall; *σφάλλω*; *fallo, falsus, labor, folium*; g. *fehlen*; d. *falen*; it. *fallire*; fr. *faillir.*

Fain. **bhadJ**, to enjoy. Cfr. goth. *faginon*; ags. *fagen.* [*van.*

Faint. **pen, pain, ven**, to go. Cfr. *vanus*; fr. *faner*; goth. ags.

Fair. **bha′**, to shine. ags. *fœger*; goth. *fagrs.*

FAITH. **vid**, (**veda**,) to perceive, to know. Cfr. *πείθω*; *videre, fido, fides*; it. *fede*; goth. ags. *vitan*; g. *wissen*; sp. *fe*; fr. *foi, feal.*

Fald-. v. Fold.

Fall, False, Falter. g. *fallen*; d. *vallen*; ags. *feallan*; fr. *affaler*; g. *falsch*; d. *valsch*; sp. *falso.* v. Fail.

Fame. v. Fac-und. Webster says of *φάω*, "I suspect this root to be contracted from *φαγω* or *φαχω*, Class Bg."

FA-MILY. **pa′**, to protect; **mil**, to associate. Cfr. פמל a family;

כלא to gather together; *pa-ter, mil-es, fa-mil-ia, famulus;* it. *famiglia;* fr. *famille.*

Famine. **bhacʃ**, to eat. Cfr. *φάγω*; *fames*, (fagmes?) fr. *faim.*

Fan. **va′**, (**va′na**,) to blow, to breathe. Cfr. *φυ-σάω*; *vannus;* fr. *van;* g. *wanne;* d. *wan;* ags. *fann.* [*tasia, fanaticus.*

Fan-. **bha′**, to shine, to appear. Cfr. *φάω, φαίνω, φαντάζω*; *phan-*

Fane. (*fanum.*) **van**, to serve, to honor.

Fang. v. Fadge.

Fanion. v. Banner.

FAR, FARE. **para**, remote; **pur**, to go before. Cfr. פרר absence; *πόῤῥω, πορεύω*; *foris, porro, præ, pro;* ags. *feor, faran;* goth. *faran;* g. *fahren, fern;* d. *varen, veer, voor;* fr. *forain, hors.*

Farce. v. Force. [v. For.

Fardel. v. Bear.

Fart. **pard**, to fart. Cfr. *πέρδω*; *pedo;* g. *furz.*

Fascia. v. Fadge. [*βασ-καίνω*; *fascino.*

Fascinating. **vaǧ**, to desire; **vaǧi**, subjugating, fascinating. Cfr.

Fash. **paʃ, vaʃ**, to strike.

Fashion. v. Facile.

Fast. v. Fadge. **upavasta**,, hunger. (A.)

Fastidious. **bhaʃ**, to rail, to reproach; **bha′ʃ**, to address; **bhas**, to blame or abuse, to eat. Cfr. בוז to loathe, to despise; *φάσις*; *fastidiosus.* [v. Sting.

Fastigiate. (*fastigiatus.*) **dha′**, to place; **tidj**, (Caus.) to sharpen.

FAT. **vaṭh, pi, pi′v**, to grow or be fat. Cfr. פטם to fatten, to cram; פרר fat; פימ a collop of fat; *πῖων*; *pinguis, fatuus;* ags. g. *fett;*

Fate. v. Fac-und. [d. *vet.*

FATHER. **pa′**, to protect, to nourish; **pitṛ**, father. Cfr. פרנ a tutor, a nurse; אב a father or instructor; *πατήρ*; *pater;* ags. *fœder;* g. *fader;* d. *vader;* sp. it. *padre;* fr. *père.*

Fathom, Fatiscence. **paṭ**, to surround; **puṭ**, to embrace, to bind; **paḍ**, to collect. Cfr. פתה to enlarge; g. *faden;* d. *vaden;* ags. *fœthem;* goth. *fatha.*

Fatuous. **vaṭharaʂ**, stupid, slow, dull. (A.) v. Fat.

Fauces. **bhacʃ**, to eat. Cfr. פה the mouth; פשר to chew the cud;

Fault. v. Fail, Fall. [*φάγω*; *faux.*

Favillous. **bha′**, to shine. Cfr. פאר brightness; *φάω*; *favilla.*

Favor. **dha′**, to place, to give. Cfr. האה a bound, affection; *θάω*;

Fay. v. Fadge. [*fa-vor, fau-tor;* it. *favore;* fr. *faveur.*

Fealty. v. Faith.

FEAR. **bhri′, bhi′, bheʃ, bhreʃ**, to fear; **bhi′ruʂ**, timid. Cfr. *φέ-*

βομαι; vereor, pavor, formido; goth. *faurhtei;* d. *vaaren;* ags. *fœran;* fr. *frayeur, effroi.* v. Bashful, Far.

Feasible, Feat, Feature. v. Fac-ile.

Feast. v. Festival.

FEATHER. **pat**, to fly; **patra**, a wing. Cfr. *πέτομαι; πτίλον; peto, penna, (petna);* g. *feder;* d. *veder;* ags. *fether.*

Febri-. v. Fever.

Feet. (af-, con-, de-, in-.) v. Fac-ile.

Fe-cund. **bhu′**, to be. Cfr. *φυ-; fu-, fe-tus, -cundus.* v. Facile, Fat.

Federal. **badh**, to bind; **vid**, to know, discover, obtain, wed. Cfr. עבט to pledge; עבת a band; *fœdus, vador.*

Fee. **paǥ**, to bind; **paǥus**, an animal. Cfr. *pecu-nia;* goth. *faihu;* og. *fihu;* g. *vieh;* d. *vee;* dan. *fee;* ags. *feoh.* v. Fend-.

Feeble. v. Ab, Ability. Cfr. *a-σθενής; de-bilis;* it. *fievole;* sp. *feble;* fr. *foible.*

Feed. **pa′**, **puʃ**, **bhat**, to nourish; **ad**, **bhudʒ**, to eat. Cfr. פה the mouth; *πάομαι; pa-sco, -bulum;* goth. *fodjan;* g. *füttern;* d. *vœden;* ags. *fœdan.*

Feign. **vantʃ**, to deceive. Cfr. *fingo;* goth. *bi-faihon;* d. *veinzen;* arm. *fincha;* sp. *fingir.* v. Figure.

-Feit. (counter-, sur-.) v. Fac-ile. [Filter, Fleece.

Fell, Felt. **vil**, to clothe or cover, to break or divide. v. Bale, Fail,

Fellow, Felly. **pel**, **phel**, **vel**, to go, to vacillate. Cfr. פלש to wallow; *volvo;* goth. *walwia;* g. *felge;* d. *velg;* dan. *falge;* ags. *fælge.*

Felon. v. Fail. [v. Follow.

FEM-. **va′mas**, a breast; **va′ma′**, a woman; **dhe**, to drink. Cfr. *θῆλυς, θηλή; femina;* fr. *fem-elle, -inin.*

Fenerate. **dhan**, to produce fruit; **dha′**, to place, to give. Cfr. *δαν-*

Feod, Feoff. v. Fee, Feud. [*εἴζω; fœnus.*

FER-. (ali-, bi-, con-, de-, re-, suf-.) v. Bear.

Ferine, Ferocious. **svṛ′**, **spṛ′**, **dhvṛ**, to injure, to destroy; **dhṛ**, to hold, to carry; **bharv**, to strike, to fight. Cfr. פרא wild, furious; *θήρ, φήρ, φθείρω; ferox, ferus, furia.* [*viren.*

Ferial. **pṛ**, to delight. Cfr. פאר to beautify; *feriæ;* g. *feier;* d.

Ferment. **gharmas**, heat. Cfr. דרם the south; *θέρμη; fervere, -mentum;* goth. *varmja.* v. Burn.

Fer-millet, -reous. **dhṛ**, to hold; **dhi′ras**, firm, solid, strong. Cfr. *ἑδραῖος, σίδηρος; fir-mus, fer-rum;* sp. *hierro;* w. *fer* (solid);

Ferry. v. Bear Fare. [fr. *fer, ferme.*

Fervent. v. Ferment. [Cfr. *con-fiteor, -fessus.*

-Fess. (con-, pro-.) **bhaʃ**, **paṭ**, to speak; **bhas**, to blame, to threaten.

Fesse. v. Fadge. [*festa;* fr. *fête.*

Festival, Fete. **bhas,** to eat. Cfr. *festum;* g. *fest;* d. *feest;* it.

Fetid. *fœtidus.* v. Putrid, Vice.

Fet-. v. Foot.

Fetus. v. Be, Fecund.

Feud. v. Faith, Hate. [Ferment.

Fever. Cfr. *fervere, febris;* it. *febbre;* sp. *fiebre;* fr. *fievre.* v.

Fiance. v. Faith.

Fib. v. Fable.

-Fic-. (amphi-, de-, pro-, suf-.) v. Fac-ile.

Fickle. **tʃal, vi-tʃal,** to vacillate; **vidʒ,** to tremble. Cfr. פוק to stagger; *vacillo;* sw. *vackla;* ags. *wicelian, ficol.*

Fict-. v. Fac-ile, Feign.

-Fid. (bi-.) **bhi̯d, bhid,** to cut, to divide. Cfr. *findo, fidi.*

Fidelity, -ucial. (af-, con-.) v. Faith.

Fidget. v. Fickle.

Field. Cfr. g. ags. *feld;* d. *vellen, veld;* sw. dan. *felt.* v. Fail, Fell.

Fiend. **bhi′,** to fear. Cfr. goth. *fijan;* g. *feind;* d. *vijand;* ags. [*feond.* v. Hate.

Fierce. v. Ferine.

Figary. v. Vag-.

Fight. **pi̯dʒ, piʃ,** to strike. Cfr. פגע to assault; *πύξ; pungo, pugna;* goth. *veigan;* g. *fechten;* ags. *feahtan;* dan. *fegter.* v. Vigor.

Fig-ure, -ment, -ulate. **pi̯dʒ,** to paint, to delineate. Cfr. *ποικίλλω; pingo, fingo, fuco, fig-ura;* fr. *figure.*

Fil-ament, File, Fili-form. **pa′li′,** a sharp edge, a line, a row or range. Cfr. *filum;* pg. it. *fila;* sp. *hilo;* fr. *file, filet.*

Filch. **vitʃ,** to separate; **bhil,** to cut; **vil,** to cover, to hide.

-File. (de-) v. Filth.

Filial. **bal,** to live, to nourish; **ba′laˢ,** young; **ba′l-aˢ, -a′,** a child, a colt; **potaˢ,** a young animal; **pa′l,** to keep, to guard. Cfr. *πῶλος; pullus, filius, filia;* goth. *fula;* fr. *fils, fille.* v. Feminine.

Fill. **pṛ′,** to fill; **pul,** to be great or large; **pu′l,** to collect, or heap up. Cfr. *πιλέω, πολύς, πόλις, πλέος; -pleo, plus, plenus, vulgus;* goth. *filu, fulls;* g. *füllen, viel, voll, volk;* d. *vol, volk, vullen;* ags. *fyllan, folc;* fr. *foule.*

Fillip. **pil,** to throw, to cast or send; **pi′luˢ,** an arrow. Cfr. *πάλλω;*

Filly. v. Filial. [*pello, pilum;* g. *pfeil.*

Film. **val, vil,** to surround, to cover. Cfr. *εἴλω; velo, velamen;* it. *velame;* ags. *film.* v. Veil.

Filter. (from Felt.) **pu′l,** to collect; **pi′l,** to press. Cfr. *πιλέω; pilo;* it. *feltro;* sp. *filtro;* fr. *filtre.*

Filth. v. Evil, Foul.

Fin. **phaṇ, pad, (pannaˢ,)** to go. Cfr. *penna;* g. dan. *finne;* d. *vin;* ags. *finn.*

Find. **vid, (vindati,)** to find. Cfr. *εἰδέω; video;* goth. *finthan;* ags. *findan;* g. *finden;* d. *vinden.*

Finger. goth. *figgrs;* g. sw. dan. ags. *finger;* d. *vinger.* v. Fadge.

Fire. **puˊ,** to purify; **pruſ,** to burn. Cfr. בּאר brightness; *πῦρ, πρῆσις; -buro, pru-;* g. *feuer;* d. *vuur;* dan. sw. ags. *fyr.*

Firm. v. Fermillet.

FIRST. **pra,** before; **prathamaˢ,** first; **paramaˢ,** first, best. Cfr. *πριν, πρό, πρῶτος; præ, princeps, primus;* goth. *faur;* d. *vor, fürst;* d. *voor, vorst.*

Fise. v. Fadge, Basket.

Fish, Fisk. **pay,** to go; **payas,** water; **ac, ic,** to go. Cfr. *ϝιχω, ἰχθύς; piscis;* goth. dan. sw. *fisk;* g. *fisch;* d. *visch;* ags. *fisc;* it. *pesce;* fr. *poisson.*

Fiss-. **bhid, bhiḍ,** to break, to cut. Cfr. בר to separate; *findo, fissura, -fidis;* fr. *fissure;* g. *beissen.*

Fist. **muſ,** to steal or take; **muſṭi,** the fist; **paᵹ, pust,** to bind. Cfr. *πύξ, πυγμή;* g. *faust;* d. *vuist;* ags. *fyst.* v. Pugil.

Fit. **pat,** to fly, to fall; **paṭ, vaṭ,** to clothe, to surround; **hitaˢ,** proper. Cfr. *πί-πτω; peto.*

Five. **pantſa,** five. Cfr. *πέντε, πέμπε; quinque;* goth. *fimf;* arm. *pemp;* g. *fünf;* d. *vijf;* dan. sw. *fem.* ags. *fif.*

Fix. *figo, fixum.* v. Fadge.

Flagrant, Flame. **bhlaˊᵹ, bhraˊdȷ,** to shine. Cfr. *φλέγω; fulgeo,*

Flagellant, Flail. v. Blow. [*flagro, flamma.*

Flake, Flask, Flax, Flex-. v. Plie-.

FLASH. **pluſ, plas,** to burn, to set free. v. Blaze.

Flat. v. Broad.

Flea, Flee, Fleet. **vliˊ, plih, pliˊ, plu,** to go. Cfr. *πλέω, πλίξ; volo;* goth. *thliuhan;* g. *fliegen, fliehen;* d. *vliegen;* ags *fleogan.* v. Float.

Fleece. **vil, vṛ, uˊrnu,** to cover; **uˊrnaˊ,** wool. Cfr. *ϝερίον; villus, vellus, lana;* russ. *volna;* goth. *vulla;* og. *wolla;* g. *wolle, fliess;* d. *vel, vlies;* ags. *fel, flys.*

Flicker, Flight, Flit. v. Flea.

-Flict. (af-, con-, in-.) Fling. v. Blow.

Flimsy. v. Limber.

Float. **plu,** to go, to swim. Cfr. *πλέω, πλωτός; pluo, pluvia, flumen;* goth. *flodus;* ags. *flota;* g. *floss;* d. *vlot;* fr. *flotte;* russ. *plot.*

Flock. v. Fill, Plic-.

Flog. v. Blow.

Flood, Flow, Flu-, (af-, con-, re-,) Fluc-, Fluv-, Flux-. v. Flea, Float.

Flower, Flor-, Flos-, Flour-. **phull,** to blossom. Cfr. *φύλλον, βλαστέω; flos, floreo, folium;* it. *fiore, foglia;* sp. *fior;* fr. *fleur, feuille.*

Flush, Fluster. v. Flash.

Fly. v. Flea.

Foal. v. Filial.

Foam. v. Fume.

Focus, Fair. **dhucſ, dah,** to burn, to kindle; **bha′,** to shine. Cfr. *φάω, φῶς; focus, for-mosus;* goth. *fagrs;* ags. *fægr;* sp. *fuego;* it. *fuoco;* pg. *fogo;* fr. *feu.*

Fodder. v. Feed.

Foe. v. Hate.

Foil, Fol-. v. Fail, Flower.

Foin. v. Point.

Fold. **pu′l,** to collect; **pa′l,** to keep, to guard. Cfr. goth. *falthan;* ags. *fealdan;* g. *falten;* dan. *folder;* russ. *phalda.* v. Cable.

Folk. v. Fill.

Follow. **pal, val, ga′,** to go. Cfr. *πολέω;* g. *folgen;* d. *volgen;* ags. *folgian.*

Fo-ment. v. Focus.

Font. v. Found.

Foot. **pad,** a foot. Cfr. בס to tread under foot; *ποδ-; ped-;* goth. *fotus;* g. *fuss;* d. *voet;* ags. *fot;* fr. *pied.*

For. **para,** after, distant, attached to; **pra,** forth. Cfr. *παρα, περα, πορρω; per, pro, præ, por-;* goth. *faur;* g. *für, vor, ver-;* d. *voor;* ags. *for;* fr. *pour;* it. *per;* sp. pg. *por.*

For-. (bi-, per-.) **pa′r,** to get through or over; **pra,** forth. Cfr. *φαρόω; foro;* g. *bohren.* v. Ter-.

For-age. v. Fare, Vor-.

Force, Fort. **vi′r, vrſ,** to be powerful. Cfr. *vireo, fortis;* it. *forza;* sp. *fuerza;* fr. *force.* v. Bear.

Ford, (af-) Fore, Foreign, -est, -feit. v. Far, For.

Forge. v. Burn, Ferreous.

Fork. v. Furc-.

Form. **dhariman,** form.

Formidable. v. Fear.

Forth. v. Far.

Fortu-ne, -itous. v. Bear, Fare.

Foss-il. **pat̨, bhid, vas,** to cut. Cfr. פּוץ to break to pieces; פּס a piece; *fodio, foss-;* it. *fossa, fossile;* fr. *fosse, fossile.*

Foster. v. Feed.

Fougade. v. Focus.

Foul. **puy,** to stink, to putrefy. Cfr. *πύθω; pus, puteo;* goth *fuls;* g. *faul;* d. *vuil;* ags. *ful, faul.* v. Evil.

Found, Fount. **bhu′,** to be; **pud,** to leave; **bus,** to pour out. Cfr. *φύω; fundo, fons, facio;* it. *fondare, foute;* fr. *fonder, fontaine.* v. Funnel.

Four. **tſatur,** (**tſatva′ras,**) four. Cfr. *τέσσαρες, πίσυρες; petoritum, quatuor;* goth. *fidvor;* g. d. *vier.*

Fowl. **pacſaˢ,** a wing; **pacfa′lu,** a bird; **vah,** to flow, to convey. Cfr. פּנג to rush; *φεύγω; fugio, passer;* goth. *fugls;* g. d. *vogel;* ags. dan. *fugl.* [d. *vos.*

Fox. **pacſ,** to seize. Cfr. *αλώ-πηξ;* goth. *faha, fauho;* g. *fuchs;*

Fract-, Frag-, Frail, Franch-, Frang-, Frank, Fray, Freak, Freek-, Free. v. Bray, Friend. [*ʽαρωμα; fra-gro.*

Fragrance. **ghra′,** to smell; **ghra′na,** odor, the nose. Cfr. *ʽριν,*

Frater-nal. v. Brother.

Fraught, Freight. v. Bear, Fare.

Freeze. **bhri′,** to fear, to hold; **bhreſ,** to fear; **bhr′,** to hold, to fry. Cfr. *φρίσσω; frigeo, frigo;* goth, *frius;* og. *friusan;* d. [*vriezen;* ags. *frysan.*

Fre-quence. **pr′,** to fill.

Fresh. **vrſ,** to rain, to be powerful; **prſ,** to sprinkle; **rſ, bhreſ,** to move. Cfr. g. d. *frisch;* dan. *frisk;* ags. *fersc;* it. sp. pg. *fresco.*

Fret, Fri-, Fric-tion. **ghrſ,** to rub, to grind, or pound; **ghr̨,** to sprinkle. Cfr. *χρίω; frictio;* goth. *fretan;* g. *fressen;* d. *vreten;* ags. *fretan.* v. Eat.

Friend. **pri′,** to please, to desire or love. Cfr. *πρᾶος; -perior, fruor;* goth. *frijon, friond;* g. *freue, freund;* d. *vriend;* ags. *freon, freond;* dan. *freude.*

Frieze, Fringe. v. Bray.

Frig-. v. Freeze, Rig-.

Frith. v. Far, For-.

Frog. **vr̨h,** to roar. Cfr. *ʽρέγχω; rugio;* ags. *froga;* d. *frosch.*

Frolick. **pri′,** to please; **la̯gh,** to leap. Cfr. *λαγώς;* goth. *laikan;* g. *froh, frohloecken;* d. *vro-lijk.*

From. goth. ags. *fram.* v. Far, For.

Front, Frown. **pra′ntaˢ,** edge, border. v. Brow, For.

Fruct-, Frug-, Fruit. **bhr̨,** to bear. Cfr. *fruor, fructus, fruges;* g. *frucht;* d. *vrucht;* it. *frutto;* fr. *fruit.* v. Friend, Orchard.

Frush, Frus-. v. Bray.
Fry. **bhṛ́**, **bhṛdʒ**, to fry. Cfr. *φρῦγω*; *frigo*; fr. *frire*.
Fuc-, Fudge. v. Figure.
Fuel. v. Focus.
Fug-. **bhadʒ**, to separate, to fly. Cfr. *φυγή*; *fuga*.
Fulg-. **bha,dʒ**, **bhra´dʒ**, **bhla´ç**, to shine. Cfr. *φλέγω*; *fulgeo*; g. *blicke*, *blitze*.
Ful-iginous, Ful-some. v. Foul, Fill.
Full. **pu´rnaˢ**, full. v. Fill.
Fulmin-. v. Bal-ister.
Fume. **dhu´maˢ**, smoke; **phenaˢ**, foam, vapor. Cfr. *θύμα*; *spuma*, *fumus*; fr. *fumée*.
Fun-ambulist. **put**, to bind. Cfr. *funis*. v. Found.
Fund. **budhnaˢ**, the root of a tree. Cfr. *πυθ-μήν*; *fundus*; g. *boden*.
Funeral. **van**, to kill. Cfr. *φόνος*; *funus*. v. Bane.
Funnel. **va´**, (**va´n**,) to blow, to breathe. Cfr. w. *fwn*, *fynnon*, *fynel*, *fwnt*.
Fur, Furnish. v. Fleece.
Furc-ate. **vṛc**, to take; **dhṛ**, to hold. Cfr. *furca*.
Furl. **dhṛ**, to hold. Cfr. fr. *ferler*; sp. *aferrar*; pg. *ferrar*.
Furlough. v. Fare, Leave.
Furnace. v. Burn.
Fuse. v. Found.
Fu-ture. **bhu´**, (**bhavitṛ**,) to be. Cfr. *φύ-ω*; *fu-i*, *-turus*.
-Fy. v. Fac-.
Gab, Gaby. **dʒap**, **gup**, to speak; **dʒabh**, to gape. Cfr. ags. *gabban*; it. *gabbare*; fr. *gaber*, *jaboter*.
Gabel, Gable. v. Cable.
Gad. **ga´**, to go; **gud**, to drive away; **gada´**, a club. ags. *gad*.
Gag-gle. v. Cach-.
Gain. **dʒan**, to produce. Cfr. *γεννάω*; *gigno*; goth *ga-geigan*; ags. *gynan*; g. *gewinnen*; sw. *gagna*; sp. *ganar*; fr. *gagner*.
Gairish. **ghṛ**, to shine. v. Again-st.
Gait. **ga´**, **gam**, (**gata**,) to go; **gati**, motion. Cfr. goth. *gatvo*; g. *gasse*; dan. *gade*; sw. *gata*.
Gala. **tʃal**, to sport; **dʒval**, to shine. Cfr. sp. it. fr. *gala*; fr. *joli*.
Galaxy. **gal**, to eat, to flow. Cfr. *γάλα*; *glutio*.
Gale. v. Chill.
Gall. v. Chol-.
Gall-ery, -eon, -ey. **cal**, to throw, to go. Cfr. it. *galera*, *galeone*, *galleria*; dan. g. *gallerie*; fr. *galerie*, *galère*; sp. *galeria*, *galeon*, *galera*.
Gall-inaceous. v. Call.
Gall-on. **cal**, to count, to hold.
Gal-lop. **çal**, to run. v. Leap.
Gam-bol, -brel, Gamble, Game, Gambit, Gammon. **gam**, **ga,b**, to

go; **gamas**, a game played with diee and men, as backgammon, &e. Cfr. it. sp. *gamba;* fr. *jambe, gambiller;* ags. *gamen.*

GAM-. (amphi-, bi-, mono-, poly-.) **cam**, to love; **yama**$_{,,}$, a pain; **upa-yam**, to marry; **dʒam**, a wife. Cfr. *γάμος;* goth. *guma;* ags. *gôma;* g. *-gam.*

Ganch. **cu̯tʃ**, to be erooked. Cfr. it. *gancio;* sp. pg. *gancho.*

GANDER, GANZA. v. Goose.

Gang. **ca̯c**, to go. Cfr. goth. *gaggan;* og. os. ags. *gangan;* ags. g. d. dan. *gang.*

Gan-oid. v. Candid.

GAP, GAPE. **dʒabh**, to gape. Cfr. ags. *geapan;* g. *gaffen;* d. *gaapen;* [sw. *gapa.*

Gar. **dʒiri**, to injure, to wound. Cfr. goth. *gairu.*

Garbage, Garble. v. Carp.

Garden, Garth. **cṛt**, to surround. Cfr. *χόρτος; hortus;* goth. *gairda, gards;* ags. *geard;* g. *gurt, garten;* it. *giardino;* sp. fr. *jardin.*

Gargle, Gargoyle. **gṛdʒ**, to grumble, to roar; **gṛ**, to sprinkle; **gṛ′**, to swallow. Cfr. g. *gurgeln;* d. *gorgelen;* it. *gargagliare;* fr. [*gargouiller.*

Gar-land, -ment, -nish. v. Carcer.

Gar-ret, -rison. **vṛ**, to screen, to eover. v. Guard.

Gar-rulity. **gṛ′**, to sound, to speak. Cfr. *γῆρυς; garrio;* w. *gair.*

Gas. **gha̯s**, to flow, to ooze. Cfr. g. *geist;* d. *geest;* ags. *gast.*

GASH. **caʃ, chaʃ, tʃaʃ, tʃhaʃ, dʒaʃ**, to strike, to kill.

Gasket. v. Case.

Gastric. **dʒaṭharas**, the belly. Cfr. *γαστήρ;* goth. *qvithrs.*

GATE. v. Gait.

GATHER. **ghaṭ, ga′dh**, to put together. Cfr. גר a troop; גדר a fold; goth. *gaiddja;* g. *gatten;* d. *gaderen;* ags. *gadrian.*

Gaud. **gud, gudh**, to play. Cfr. *gaudeo.*

Gaunt. **cu′n̤, tʃu′n̤**, to contract.

Ge-. v. Con-.

Gear. v. Ger-.

GEL-. (ag-, eon-.) v. Chill

GEMINI. **yama**$_{,,}$, a pair.

GEN-. **dʒan**, to produec; **dʒanas**, man. Cfr. *γένος; genus, genius, genitus;* it. *genere;* fr. *genre.* v. Begin.

GENICULATE, Genu-. v. Knee.

Gent-. v. Gen-.

Geo-, Gee. **gaus**, the earth. Cfr. *γῆ.*

Ger-. (ali-, belli-, eon-.) **hṛ**, to take, to convey.

Geranium. v. Crane.

GERO-comy. **dʒṛ′**, to grow old. Cfr. *γέρων.*

Get. **hud, hu,d,** to collect, to take; **tʃat,** to seek. Cfr. *χανδ-άνω; pre-hend-o;* goth. *bi-git-an;* ags. *gitan;* it. *cattare.* v. Gather,
Ghast-, Ghost. v. Gas. [Gen-.
Ghoul. **gal,** to eat.
Gibber, Gibe. v. Gab.
Gibbous. **cubdʒaˢ,** crooked. Cfr. גב prominent; *κύπτω, κυφός;*
Giddy. **cad,** to be confused. ags. *gidig.* [*gibbus;* fr. *gibbeux.*
Giggle. v. Cach-.
Gimp. **guph, gu,ph,** to string, to sow, to tie.
Gin, -Gine. v. Gen-.
Ginger. **ɕriṅga´ra,,** ginger. Cfr. *ζιγγίβερις; zinziber;* sp. *gengibre;*
Gir-. v. Carcer. [fr. *gingembre.*
GIRD. v. Garden.
Girl. **gauri´,** a young girl.
Glab-. v. Glib.
Glac-. v. Glass, Gel-. [ags. sw. dan. *glad.*
GLAD, Glee. **hla´d,** to gladden, to be glad. Cfr. *laetus;* goth. *hlas;*
Glance, Glass. **las,** to shine. Cfr. *glacies;* ags. dan. g. d. *glas;* fr. *glace.* [*glaucus.*
Glaucous, Gleam, Glim-. **glauˢ,** the moon. Cfr. *γλαυκός, γλήνος;*
Glib. **lip,** to anoint, to smear. Cfr. *glaber;* d. *glippen.*
Glis-ten, Glit-ter, Glose, Gloss, Glow. v. Glance, Glaucous, Cauldron.
Glottis. **lad,** to loll the tongue. Cfr. *γλῶττα.*
Gluc-, Glut, Glyc-. **gal,** to eat, to ooze; **gulyaˢ,** sweet. Cfr. *γλυκύς; dulcis, glutio;* fr. *engloutir.* [d. *knagen.*
Gnaw. **nachaˢ,** a finger nail. Cfr. *κναω;* ags. *gnagan;* g. *nagen;*
-GNIZE, (a-, co-,) Gnom-, Gnos-. **dʒna´,** to know. Cfr. *γνῶσις;* *gnosco;* goth. *kann;* ags. *cnawan;* g. *kennen.* v. Can.
Go. **ga´,** to go. Cfr. g. *gehen;* d. *gaan;* ags. *gan.*
Gob. v. Gab. [dan. *gud;* d. ags. *god.*
God. **gud,** to guard, to preserve. Cfr. goth. *guth, gud;* g. *gott;*
Goel. v. Yellow.
Gold. **hir-aṇa,,** **gaura,,** **abhra,,** gold; **dʒval,** to shine; **gauraˢ,** yellow. Cfr. *χρ-υσός;* goth. *gul-th;* d. *goud;* dan. *guld;* g.
Golf. v. Clavate. [ags. *gold.* v. Yellow.
Goll, Golore. v. Claw.
-GON. (dia-, hexa-, poly-.) **coṇaˢ,** an angle. Cfr. *γωνία.* v. Cone.
Gondola. **cantha´laˢ,** a boat.
Gong. **gandʒ,** to sound. [d. *gœd;* sw. dan. ags. *god.* v. God.
Good. **ɕudh,** to be pure. Cfr. *αγαθός;* goth. *goth, gods;* g. *gut;*
Goom. v. Bride-goom, Gam-.

Goose. **ha,sa<**, a goose. Cfr. *χήν; anser;* g. d. *gans;* it. *ganza;*
Gore. v. Aehor. [sp. *ganzo;* dan. *gaas;* ags. *gandra, gos.*
Gore. **gu´r**, to hurt, to injure. [*gorja;* fr. *gorge.* v. Gargle.
Gorge. **grdJ**, to roar, to sound. Cfr. *garrio, gurges;* sp. *gorgear,*
Gormand. **gṛ´**, to eat; **ma,d**, to rejoice. Cfr. fr. *gourmand.*
Gorse. v. Grass.
Gout. v. Gutta, Gust-.
Grab. **grah, gṛbh**, to take, to seize; **dJṛbh**, to gape, to yawn. Cfr. *γράφω; scribo;* goth. *greipan;* g. *greifen, schrapen;* it. *grappare.*
Grace. **hṛd**, the heart; **hṛdya<**, grateful, pleasant; **crath**, to amuse. Cfr. *χαίρω, χάρις; gratus, gratia;* fr. *grè, grace;* it. *grazia.*
Grad-. **hrud**, to go. Cfr. *gradior, gradus;* sp. it. *grado;* fr. *grade;* ags. *hrad, hraes, hreosan;* g. *grad;* d. *graad.*
Grain. v. Kernel.
Gramin-. v. Grass. [fr. *grand.*
Grand. **dJṛ´**, to grow old. Cfr. *γέρων; grandis;* sp. it. *grande;*
Grap-, Grasp. v. Grab.
Grass. **gṛ´, gras**, to eat. Cfr. *γράω; gra-men;* goth. g. d. *gras.*
Grat-. v. Grace, Crash. [sp. it. *grave.* v. Grab.
Grave. **gurus, gurvi´**, heavy, difficult. Cfr. *βαρύς; gravis;* fr.
Gravy. **cravya,,** flesh. Cfr. *κρέας; carn-is.* [v. Grand.
Gray. **dJṛ´**, to grow old. Cfr. it. *grigio;* g. *grau;* d. *graauw.*
Graze. v. Grass, Crash.
Great. v. Grand, Crescent.
Grease. v. Chris-. [d. *greetig;* ags. *grædig;* fr. *gré.*
Greed-. **grdh**, to desire, to be greedy. Cfr. goth. *gredon, gredags;*
Green. **haris**, green; **harinas**, yellowish white. Cfr. *χλωρός; viridis;* g. *grün;* d. *groen.* [Cry.
Greet. **cra,d**, to weep, to call. Cfr. ags. *gretan;* d. *grœten.* v.
Greg-. (ab-, ag-, con-, se-.) **hrag**, to cover; **hrud**, to collect. Cfr *grex;* goth. *hairda;* g. *herde;* ags. *heord.*
Gress-. (ag-, con-, re-.) v. Grad.
-Gret. v. Greet.
Grief. v. Grave.
Grim, Grum. **ghur**, to be frightful or terrible. Cfr. *horreo;* g *harm, grimm;* sw. dan. g. d. *gram;* ags. *grim, gram.*
Grip, Gripe. v. Grab.
Grisly. v. Horr-.
Grist, Grit. **ghṛs**, to grind.
Grope, Group, Grovel, Grub, Gruff. v. Grab.

GROT. **gartaˢ**, a hole, a cavern. Cfr. d. *grot;* g. dan. fr. *grotte;* it. *grotta.*

Guaranty, Guard, Guerdon. **vṛ**, to select, to screen, to cover. Cfr. *φρουρός;* ʿ*οράω;* *vereor, verus;* goth. *vars;* g. *wart, wahr;* d. *waar, waaren;* it. *guardare;* sp. pg. *guardar;* fr. *garder.*

Guest. **ghas**, to eat; **dʒuſ**, to like, to please. Cfr. *gustare, hostis;*

Guise. v. Wise. [goth. *gasts;* g. d. ags. *gast;* fr. *gouter, hote.*

Gular, Gul-, Gulp. v. Collar.

Gules. fr. *gueules.* **dʒval**, to shine. [*golfo.*

Gulf. **cul**, to collect. Cfr. *κόλπος;* d. *golf;* fr. *golfe;* it. sp. pg.

Gun. v. Cannon.

Gurge, Gurgle. v. Gorge.

Gush, Gust, Guzzle. v. Gas, Guest.

Gutta, Gutter. **tſut**, to wet, to drop; **gaḍ**, to flow. Cfr. *χυτός;* *gutta;* fr. *goutte;* sp. pg. *gota.* [*gen-itor;* goth. *gvens.*

GYN-. **dʒan**, to produce; **dʒaniˊ**, a woman. Cfr. *γυνή, γεννάω;*

Gypsum. **gup**, to conceal, to protect. Cfr. גוף to shut up; *γύψος.*

Hab-, Haft. **aˊp**, to obtain, to have; **av**, to keep. Cfr. ʿ*αφάω;* *habere;* goth. *haban;* g. *haben;* d. *hebben;* sp. *haber;* pg. *haver;* it. *avere;* fr. *avoir;* ags. *habban.* v. Cip-.

Hail, Hale, Hal-. v. Ael-, Ali, Call, Calli-, Haul.

Hair. **vṛ, uˊrṇu**, to cover; **urṇaˊ**, wool. Cfr. *ʷέριον;* *hirsutus;* g. d. dan. *haar;* ags. *haer.*

Halloo. v. Alloo, Call.

Hall. **aˊlayaˢ**, a dwelling. v. Cell, -Cile.

Halm. v. Calamus, Culminate.

Hals-. v. Collar. [*halts.* v. Hold.

HALT. **chol**, (**cholati**,) to be lame. Cfr. *χωλός;* *claudus;* goth.

Ham. v. Cam, Home.

HAND. **huˌḍ**, to collect, to take. Cfr. *χανδ-άνω;* *pre-hend-o;* goth. *handus;* g. d. dan. ags. *hand.* [*hangan;* g. d. *hangen.*

Hang. **yudʒ**, (**yuˌcte**,) to join. Cfr. *jungo;* goth. *hahen;* ags.

Hank. **aˌc**, to count. v. Hook.

Hanker. v. Hunger.

Hap-. v. Hab-. [*har-asser.*

HAR-. **hṛ**, to take, to seize, to steal. Cfr. *car-po;* g. d. *heer;* fr.

Har-bor. **puraˌ**, a city. v. Borough. [g. *hart;* d. *hard;* fr. *hardi.*

Hard. **dʒaraṭhaˢ**, hard, solid. Cfr. *χράτος;* *cert-are;* goth. *hardus;*

Has. **as**, to take or receive.

Haste. v. Heat.

Hat. v. Hood.

Hate. **het, vaˊdh**, to vex, to oppose; **dviſ**, to hate. Cfr. *κότος,*

ὀδύσσω; odium; goth. *hatan;* g. *hassen;* d. *haten;* ags. *hatian.*

v. Cut, Heat. [d. *halen.*

Haul. **cal,** to throw or cast, to seize. Cfr. *κέλλω; -cello;* g. *holen;*

Haulm. v. Calamus, Culminate. [sp. it. pg. *anca.*

Haunch. **aṅca,,** the flank. v. Anchor. Cfr. g. *hanke;* fr. *hanche;*

Have. v. Hab-.

Haw. v. Hedge. [*hav-ik;* ags. *haf-oc.*

Hawk, Havoc. v. Cip-, Auction. Cfr. *ac-cip-iter;* g. *hab-icht;* d.

Hawser. v. Haul.

Hay. **tʃho,** to cut. Cfr. goth. *hawi;* g. *hauen, heu-en;* d. *houwen, hooi;* ags. *heawian, hæg.* v. Hedge.

Head. v. Cephalic, Heap.

Heal. v. Hail. [v. Cip-.

Heap. **ubh,** to fill. Cfr. goth. ags. *hup;* g. *haufe;* d. *hoop, heup.*

Hear. **ɕru,** to hear. Cfr. g. *hören;* d. *hooren;* ags. *heoran.*

Hearse. v. Har-, Rehearse.

HEART. v. Cardiac.

HEAT. **hutaˢ,** burnt as an oblation; **hetiˢ,** flame; **hat,** to shine; **cut,** to burn. Cfr. כוה to burn; *καίω; æstus;* goth. *hais, haists, heito;* g. *hitse, hastig, heissen;* d. *heet-en, hitte, hitsig;* ags. *hætan;* sw. *het-ta;* dan. *hede.* v. Ash.

Heav-en. **nabhaˢ,** sky; **upa,** excess, over. Cfr. goth. *hafjau;* g.

Heazy. **caˊs,** to cough. [*heben;* d. *heffen;* ags. *heofau.* v. Heap.

Hebd-. v. Sept-.

Hecatomb. v. Hundred.

Hederal. **hed,** to encompass.

Hedge. **yudʒ,** to join; **hed,** to surround. Cfr. *jungo, cingo;* g. *hecke;* d. *haag;* ags. *hæg, hegge;* fr. *haie.*

Hedr.- v. Sanhedrim. [d. *hœden;* ags. *hedan.*

Heed. **gu,d, hed,** to surround, to guard. Cfr. *κηδέω;* g. *hüten;*

Heel. **ɕal,** to run. Cfr. *salio, calx;* d. dan. *hiel;* sw. dan. *hæl;*

Hegemonic, Hejira. **adʒ,** to go. [ags. *hel.*

Height. **hi,** to enlarge; **utftfaˢ,** high. Cfr. *aug-ustus;* goth. *hauh;* g. *hoch;* d. *hoog;* ags. *heag.*

Heinous. **han,** to kill; **enaˢ,** sin, offence. [it. *erede;* fr. *hevitier.*

HEIR. **hr,** (**haraˢ,**) to seize. Cfr. ירש to inherit; *αἱρέω; hæres;*

Hele, Hell. v. Ceil, Cell, Coal.

Heli-. v. Solar. [g. d. ags. *helm.*

Helm. **dʒal, ɕal,** to cover. Cfr. *galea;* goth. *hilms;* sp. *jelmo;*

Help. **clrp,** (**calp-,**) to become, to make, to suffice. Cfr. goth. *hilpan;* g. *helfen;* d. *helpen;* ags. *helpan.*

Hemi. v. Semi.
Hemp. v. Cannabine.
Hen. **can**, to sound. Cfr. *can-ere;* goth. *hana;* g. *hahn, henne;* [d. *haan, hen;* ags. *hen, henne.*
Hence. **hi´nas**, left, abandoned. Cfr. goth. *hina;* g. *hin;* ags. *heona.*
HEND. (ap-com-pre.) v. Hand.
Hept-. v. Sept-.
Herald. v. Cry.
Herbs. **arbhas**, herbs.
HERD. v. Greg-.
HERED-, Heret-. v. Heir.
Here-tog. v. Har-.
Hero. **ϕu´ras**, a hero. Cfr. *κύριος, ἥρως.* v. Har-, Vir-.
Heron. v. Crane.
Herp-. v. Serpent.
Hest. v. Heat.
HESTERN. v. Yester-.
Hetero-. v. Alter-.
Hex-. v. Six.
Hey. **hay**, to sound; **hve**, to call.
Hiccough· **hicca´**, hiccough. Cfr. d. dan. *hik;* fr. *hoquet.*
Hide. **gudh**, to encompass. Cfr. *κεύθω; condo;* ags. *hydan;* g. *hüten;* d. *hœden;* sp. pg. *cuidar.* v. Heed.
Hie. **hay**, to go.
Hiem-. v. Hyem-.
Hight. **hutas**, called.
HILAR-ITY. **hil**, to dally, to wanton. Cfr. *ἱλαρός; hilaris.* v. Glad.
HILL. **cul**, to heap up. Cfr. *κήλη; collis;* sw. *hol;* ags. *hyll.*
Himalaya. **himas**, cold; **layas**, habitation.
Hind. v. Hence.
Hinge. **yundʒanas**, uniting, joining with. v. Hang.
HINT. **tʃi̯t**, to consider, to meditate. Cfr. it. *cenno.*
Hip. v. Heap.
Hippo-. **aϕvas**, a horse. Cfr. (*ικϝος,*) *"ιππος; equus;* goth. *aihvus.*
Histrionic. **has**, to laugh.
Hit. **hi**, (**heta´**,) to throw; **hitas**, suitable; **uth**, to strike, to knock [down. Cfr. sw. *hitta;* dan. *hitter.*
Hither. v. It.
Hive, Hob. v. Heap.
Hoard. v. Har-.
Hoarse. **hras**, to sound.
Hock. v. High.

Hod. v. Hood.

Hog'shead. v. Ox. Cfr. g. *oxhoft;* d. *okshoofd;* sw. *oxhufvud.*

Hold, Hole, Hollow. **chal, cul,** to collect. Cfr. ags. *healdan;* g. *halten;* d. *houden.* v. Calyx, Cull, Coil.

Holo-, Holy. v. Hail.

Homage. **homaˢ,** burnt offering, accompanied by prayers.

Home. **ɢam,** to be tranquil. Cfr. *κώμη, κοιμάω;* goth. *haims;* g. d. *heim;* ags. *hæm.*

Homo-. **samaˢ,** similar, complete. Cfr. *ʺαμα, ʽομός, ʽομοῖος; simul, similis;* goth. *sama;* g. *sammeln;* g. *zaam.*

Hone. **han,** to strike, to kill. Cfr. *ʾαχόνη;* ags. *hænan;* sw. *hen.*

Hon-. **can,** to desire, to love. Cfr. *κυνέω; honos, honestus.*

Hood. **hud,** to collect, to heap together. Cfr. goth. *haidus;* ags. *had, hade, hod;* g. *heit;* d. *heid.*

Hoof, Hoop, Hop. v. Heave. **ɢaphaˢ,** a horse's hoof.

Hook. **ac, aᵢc,** to wind. Cfr. חכה a hook; *ʾαγκών; uncus;* ags. *hōc;* g. *haken;* d. *haak.*

Hoot. **cutt,** to despise, to censure.

Hora-, Hour. **horaʹ,** an hour; **vaʹraˢ,** time, opportunity; **hr,** to to take. Cfr. *ʺωρα; hora;* g. *uhr;* d. *uur;* it. *ora;* fr. *heure.*

Horde. v. Greg-.

Hore. **hr,** to destroy, to take by violence. Cfr. g. ags. *hure;* d. *hoor;* dan. *hore.*

Horn. **ɢrʹ,** to wound; **ɢrnga,,** a horn. Cfr. g. sw. dan. *horn;* d. *hoorn;* sp. *cuerno;* it. pg. *corno;* fr. *corne.* v. Cranium.

Horr-. **hriʹ,** to be ashamed; **ghur,** to be terrible. Cfr. *horreo;* g. *grausen.*

Horse. **hr,** to take; **href,** to neigh; **hariˢ,** a horse. Cfr. ags. sw. *hors;* g. *ross;* d. *ros;* fr. *rosse;* it. *rozzo.*

Hort-. **ard,** to ask.

Horti-. v. Garden.

Hose. **cus,** to embrace. Cfr. g. *hose;* d. *kous;* ags. *hos;* fr. *chausse.*

Hound. v. Canine.

House. **aʹvaʹsaˢ,** a house. v. Case, Cot, Hose. Cfr. g. *hause;* d. *huis;* goth. ags. sw. dan. *hus;* it. *casa.*

Hovel, Hover, Huff. v. Heap.

How, Hoy. **huʹ,** an interjection of calling, contempt, &c.; **hve,** to call.

Howl. v. Call, Wail.

Hud, Huddle. **hud,** to heap together.

Hue. v. How.

Hug. v. Hedge.

Huge. v. Height.

Hulk, Hull. **hul,** to cover, to go. Cfr. *καλ-ύπτω;* goth. *huljan;* g. *hülse;* d. nl. *hulse;* ags. *hul, hulc.*

Hum. v. Hymn. [*humus, humilis.*

Hum-. **ucſ**, to moisten; **bhu´mi**ꜱ, earth. Cfr. ʽυγ-ρός; *uv-eo, umor,*

Hump. v. Heap.

Hunch. v. Angle, Hook.

HUNDRED. **ϛata**„ a hundred. Cfr. ″ε-χατον; *centum;* goth. *hunda;* g. *hundert;* d. *honderd;* ags. dan. *hundred;* it. *quintale;* fr. *quintal.*

Hunger, Hunks, Hunker. **ca´ˌcſ**, **a´nca´ˌcſ**, to desire; **gṛ´**, to eat. Cfr. goth. *huhrus;* og. os. *hungar;* g. ags. dan. sw. *hunger;*

Hur-. **ṛ**, to go; **araꜱ**, quick. v. Har-, Car. [d. *honger.*

HURT. **tſṛt**, to hurt; **ard**, to harass; **artiꜱ**, pain. Cfr. ags. *hyrt;*

Husk. **ϛuſcaꜱ**, dry. [it. *urtare;* fr. *heurter.*

Hussar. **aϛvaꜱ**, a horse. Tartar, *uswar*, cavalry.

HUT. v. Cot.

HYD-. **uˌd**, to moisten. Cfr. ″υδ-ωρ; *unda;* goth. *vat-o.* v. Water.

HYEM-. **himaꜱ**, cold. Cfr. *χειμών; hiems.*

Hygiene. v. Veg-.

Hygro-. **ucſ**, to sprinkle, to moisten. Cfr. ʽυγρός.

Hymen. **yam**, to stop, to restrain; **upa-yam**, to marry. Cfr. ʽυμήν.

Hymn. **am**, to sound; **sumnaꜱ**, a hymn.

HYP-, HYPO-. **upa**, a particle of vicinity, inferiority, &c. Cfr. ʽυπό;

HYPER-. v. Over. [*sub.*

HYPNO-. **svapnaꜱ**, sleep. Cfr. ″υπνος; *somnus;* on. *svefn.*

Į. **aham**, I. Cfr. ʾεγών; *ego;* goth. d. *ik;* g. *ich;* ags. *ic;* sw. *jag;* sp. *yo;* it. *io;* fr. *je.*

Ich-. **ich**, to go. Cfr. ″ιχνος, ″ικω, ʾιχθύς, ʾιχώρ. v. Achor.

Idea, Idol. v. Wit.

Idem-. v. It, Item.

IGN-. **agniꜱ**, fire. Cfr. *ignis.*

Ill. **il**, to lie down.

Imi-tate. v. Homo-.

Imper-. v. Emperor.

In. **ni**, in, on, a negative particle; **antar**, within. Cfr. ʾεν; *in;*

INDEX. v. Dic-. [goth. *in, inna;* ags. g. d. it. *in;* fr. sp. *en.*

INGENU-. v. Gen-

INJURE. **dȷu´r**, to injure.

INTER-. v. Enter.

INTIMATE. **antamaꜱ**, nearest. [*aveugler.*

In-veigle. **vaˌg**, **vadȷ**, to go; **vah**, to carry. Cfr. *vagor, veho;* fr.

In-vite. v. Bid. [w. *irad;* sw. d. *vrede;* ags. *wræth.*

Irate. **aratiꜱ**, anger; **radh**, to hurt or injure. Cfr. ʾερέθω; *ira;*

Irk. **i´rcſy**, to envy; to feel impatient at another's prosperity. v. Ergo.
Iron. **a´ra**,, oxide of iron; **ayas**, iron. Cfr. *æs;* goth. *eisarn;* g. *eisen, eisern;* d. *ijser;* ags. *iren;* dan. *iern.*
Is. **as**, to be. Cfr. ὥ he is; *'εστί; est;* goth. g. *ist;* fr. *est.*
Isa-, Iso-. v. Equal.
-Ish. **iſ**, to do often. Cfr. *-esco;* ags. *-isc;* dan. *-isk;* g. *-isch;* fr. [*-esque.*
Issue. **iſ, su**, to go. Cfr. fr. *issue;* it. *uscire.*
It. **ida**,, this. Cfr. *οὗτος; id;* goth. *ita;* g. *es;* d. *het;* ags. *hit.*
-It. (ad-, in-,) **it̩**, to go. Cfr. *it, iter, iterum;* goth. *ith;* g. *wieder.*
Item. **iti**, thus. Cfr. *ita, item, idem.*
Jabber. v. Gab.
Jaekal. **ʂr̩ca´laˢ**, a jaekal.
Jane. **dʃani´**, a woman.
Jangling. **dʃhandʃhana**,, a jangling.
Janty. v. Genteel.
Jape. **tſap**, to deeeive. v. Gab.
Jaw. v. Chaw.
Jeer. **a´-cſar**, to aeeuse, to revile. v. Shear.
Jelly. v. Chill.
Jeo-, Jeu. v. Jovial.
Jet. v. Shoot.
Jewel. **dʃval**, to shine. Cfr. g. sw. *juwel;* d. *juweel;* fr. *joyau;* [sp. *joyel;* it. *gioiello.*
Jilt. **tſal, tſill**, to wanton.
Jingle. v. Jangle.
Joe-, Joke. **dʃacſ**, to laugh.
Join. **yu, yudʃ**, (**yu̩cte**,) to join; **yu´niˢ**, union. Cfr. *ζεύγνυμι; juxta, jungo, jugum;* goth. *juk;* it. *giungere;* fr. *joindre.* v. [Yoke.
Jolly. v. Gala.
Jolt. **tſal**, to shake. [*jouter.*
Jostle, Jounce. **dʃas**, to strike. Cfr. it. *giostrare;* sp. *justar;* fr.
Jour-. v. Dawn.
Jovial, Joy, -Joice. **dʃi̩v**, to exhilarate; **dʃuſ**, to like, to please.
Judge, Judie-. **dʃa̩s**, to protect; **diʂ**, to order, to explain, to give. Cfr. *δίκη; jus, judex;* fr. *juger.*
Jug-, (eon-,) Junc-. v. Join.
Juice. **tſu´ſ**, to drink, to suck.
Jump. **tſa̩p**, to go, to move; **dʃhampaˢ**, jumping.
Jungle. **dʃa̩galaˢ**, desert, wild.
Junior. **yuvan, yu´ni´**, young. Cfr. *juvenis, junior.*
Jur-. **tſar**, to be certain.
Jus-. v. Judge.

JUVEN-. v. Junior.
Juxta-. v. Join.
Kale. v. Caul.
Kal-. v. Calli-.
Kedge. **catʃ**, to bind.
KEEL. **ci´l**, to fasten, to pin. Cfr. g. d. *kiel;* dan. *kiil;* fr. *quille.*
Keen. **ga´n**, to sharpen. Cfr. ags. *cene;* g. *kühn;* d. *kœn.* v.
Keep. **gup**, to guard or protect. v. Cip-. [Knife, Know.
Keeve. v. Cave.
Keg. v. Cag.
Kelter. v. Cloth.
Ken. v. Can, Know.
Kennel. v. Canal, Canine.
Kentle. v. Hundred.
Kerf, Kerve. v. Carve.
Kern. **carn**, to pierce or bore; **tʃu´rn**, to pound, to grind.
Kettle. **cut**, to make crooked; **cutas**, a water pot; **cathira´**, hard, solid, an earthen vessel. Cfr. קדר a kettle; *χοτύλη*; *catillus;* goth. *katils;* on. *kati;* g. *kessel;* d. nl. *ketel;* ags. *cetel.*
Key. v. Cag.
Kibe. v. Chap.
Kid. **dʒa´tas**, (**dʒan,**) born. Cfr. גדי a kid; *hœdus;* g. d. *kind.*
Kilt. v. Cloth.
Kimbo. v. Cam.
KIN, Kind. v. Gen-, Kid.
Kindle. **can**, to shine; **indh**, to kindle. v. Candid.
Kirk. v. Church.
Kirtle. **crt**, to surround, to clothe. Cfr. sw. *kiortel;* ags. *cyrtel.*
KISS. **cus**, to embrace. Cfr. g. *küssen;* d. *kussen;* ags. *cyssan.*
Kitchen. v. Cook.
Kite. v. Cat. [nl. *knie;* fr. *genou.*
KNEE. **dʒa´nus**, the knee. Cfr. *γόνυ*; *genu;* goth. *kniu;* g. d.
Knife, **tʃun**, to cut. Cfr. ags. *cnif;* dan. *kniv;* sw. *knif;* fr. *canif.*
Knit, Knot. v. Net.
Knout. **cnath**, to hurt, to kill.
KNOW-ledge. v. -Gnize. **ladʒ**, to be manifest; **lotʃ**, to perceive.
Knuckle. **cangulas**, the hand. v. Nail.
KORAN. **cur**, to sound. Cfr. Ar. *kara,* to read, to call, to teach.
Lab-. **la,b**, to sound, to fall; **lap**, to speak; **labh**, to get. Cfr.
Lachrymal. v. Tear. [*labor, labium.*
Lackey. v. Legate.

LAD. **la̯t**, to be childish; **la̯d**, to frolic.
Lag-. v. Languid.
Lagoon, Lair, Lake. v. Lay.
Lame. **la.b**, to fall. Cfr. ags. *lame*; g. sw. *lahm*; d. dan. *lam*.
Lamp. **lip**, to smear, to burn. Cfr. *λίπος*, *λάμπω*; *limpidus*, *lam-*
Lane. **lai̯n**, to go. [*pas*; fr. *lampe*.
LANGUAGE. **la.gh**, **la.dʒ**, to speak. Cfr. *lingua*; it. *linguaggio*; fr. *langage*. [Cfr. *λαγγέω*, *λαγαρός*; *languidus*.
Languid, Lank. **landʒa′**, sleep; **la.g**, to limp; **la.gh**, to diminish.
Lap-, Lapse. v. Lab-.
LASCIVIOUS. **laſ**, to desire. Cfr. *λάω*, *λίσσομαι*; *lascivus*; goth. *lustus*; fr. *lascif*; it. sp. *lascivo*.
Lash. **luſ**, to hurt or injure. [*lascivus*; fr. *lascif*; it. sp. *lascivo*.
Lat-. (ab-, col-, de-, re-.) **luth**, to rob; **lud**, to cover or conceal.
Latration. **la̯t**, to cry out. [Cfr. *λήθη*; *-latio*, *latens*.
Laud. v. Loud.
Launch. **lu.tſ**, to pluck up.
Lav-. **dha′v**, to wash.
Law, Lawn, Lay, Lea. **lag**, to touch; **hlag**, to collect; **la.gh**, **loc**, to speak. Cfr. *λέγω*; *lex*, *lego*, *lugeo*, *locus*; goth. *lagyan*; ags.
Lazy. **alasaˢ**, lazy. [*lecgan*, *laga*; sw. *lag*; it. *legge*. v. Loc-.
Lead. v. Load.
League. **hlag**, to collect. Cfr. *ligo*; it. *lega*; sp. *liga*; fr. *ligue*.
Leap. **lep**, to go. Cfr. *λείπω*; goth. *hlaupan*; ags. *hleapan*; g. *laufen*; d. *loopen*. [*leder*; ags. *lether*.
Leather. **lud**, to adhere to, to cover. Cfr. goth. *hleithr*; g. d.
Lea, Ley. v. Loc-.
Learn. v. Lore.
Leave. **lep**, **rev**, to go. Cfr. *λείπω*; ags. *læfan*.
Leech-. v. Lick.
Lect-. v. Law.
Leden. **lad**, to use the tongue. ags. *lyden*.
LEEF, Leof. v. Love.
Lees, Leese, Lesion, Leze. v. Lash, Less.
Leg-. v. Law, Log-.
Leg. **la.g**, to go.
-Lepsy. v. Lab-.
LESS. v. Olig-.
Lesson. (lectio.) v. Log-, Lore.
Leth-. v. Lat-.
Lev-. **laghuˢ**, light. Cfr. *ἐλαχύς*; *levo*, *levis*; ags. *liht*; g. *leicht*; d. *ligt*; fr. *leger*.

Lewd. **lad**, to wanton; **lud**, to embrace. Cfr. g. *ludern*; w. *llodig*.
Liable, Liaison, -liance. (fr. *lier*.) v. Lig-.
Lib-. **lubh**, to desire; **lubdhas**, covetous. Cfr. *λίπτω*; *lubet, libet, libido*; goth. *liubs*; g. *lieben*; d. *lieven*; ags. *leof, lufian*.
Librate. **li**, equality, sameness; **bhr**, to bear.
Lice. **licca'**, **licfa'**, a nit, a young louse. Cfr. g. *laus*; d. *luis*;
Licit. v. Law. [ags. sw. dan. *lus*.
Lick. **lih**, to taste, to lick. Cfr. לקק to lick; *λείχω*; *lingo*; goth. *bi-laigon*; g. *lecken*; d. *likken*; fr. *lecher*.
Licorice. (*glycyrrhiza*.) v. Gluc-.
Lid. **lud**, to cover. Cfr. לוט to cover; *κλειδ-*; *claudo, cludo*; ags.
Lie. v. Law. [*hlid*; d. dan. *lid*.
Lief. v. Lib-.
Liege. v. Lig-.
Lieu. v. Loc-.
Lift. **labh**, to get. Cfr. *κλέπτειν*; goth. *hlifan*; ags. *hlifian*. v. Lev-.
Lig-. **a'-lig**, to embrace. Cfr. *λύγος*; *ligare*. v. Law.
Light. **las**, **la.dʒ**, **loc**, to shine. Cfr. *λευκός*, *λύχνος*; *lux*; goth. *liuhath*; g. *licht*; ags. *leoht*. v. Lev-.
Like. **laf**, to desire; **latʃh**, to mark. Cfr. *ἠ-λίκος*; *de-lecto, ta-lis*; goth. *leikan, leiks*; g. *gleich*; d. *lijk*; ags. *lician, lic*.
Limb-er, Limp. **lambas**, pendulous. v. Lame.
Lime. v. Loam.
Lin-. v. Lig-.
Ling-, Link. v. Long, Lang, Light.
Ling-. **lich**, **li.g**, to go, to move.
Lip. **lap**, to speak; **la.bas**, broad, pendulous. Cfr. *labium*; g.
Liquid. **li'**, to liquefy. [dan. ags. *lippe*; d. *lip*; pers. *lab, lib*.
-Lish, List, Litany. v. Lust, Like.
Lit-. **lut**, to resist, or oppose. [os. ags. *hladan*; g. *laden*.
Load. **lud**, to cover, to rest in or on. Cfr. goth. *af-hlathan*; og.
Loam. **lip**, to smear; **limpas**, smearing, plastering. Cfr. *λίπος*; *limus*; g. *lehm*; d. *leem*; ags. *lam*; dan. *lim*; w. *llim*; fr. *limon*.
Lob, Lobe. v. Lab-.
Loc-. **locas**, a division of the universe; **loc**, to see. Cfr. *locus*.
Lock. v. Plic-. [ags. *logian*.
Lodge. **la.dʒ**, **lu.dʒ**, to dwell. Cfr. it. *loggia*; fr. *loger*; sp. *alojar*;
Loin. v. Clin-.
Log-. **la.gh**, **loc**, **lotʃ**, to speak. Cfr. *λέγω*, *λόγος*; *loquor*.
Loll. **lal**, to loll, to thrust out the tongue. Cfr. *λαλέω*; g. *lallen*.

Long. **lagnaꞅ**, connected with; **la‚g**, to go or move. Cfr. *longus;*
Looby. v. Lab-. [goth. *laggs;* g. *lange;* d. dan. ags. *lang.*
Loose. v. Less.
Look. **loc**, to see. Cfr. *λεύσσω*; ags. *locian;* g. *lugen.*
Lop. **lu‚p**, to cut.
Lope. v. Leap.
Loq-. v. Log-.
Lore. **laꞅ**, to be skilful; to do anything skilfully or scientifically. Cfr. goth. *lasjan;* g. *lehren, lernen;* d. *leeren;* ags. *læran.*
Lot. **la‚d**, to toss, or throw up; **luʹ**, to cut. Cfr. goth. *hlauts;* ags. *hlot;* g. *los;* d. *lot;* it. *lotto;* fr. *lot-ir.*
Loud. **ɢru**, to hear; **lut**, to speak; **cla‚d**, to call; **hlaʹd**, to sound. Cfr. *κλυτός; cluo;* goth. *hliuma;* og. *hlut;* g. *laut;* ags. *gehlyd.*
Lounge. v. Long.
Louse. v. Liee.
Lout. v. Lad.
Love, Lub-. v. Lib-.
Low, Loy-. v. Law, Lay.
Lubber. v. Lab-.
Luc-. v. Light.
Luck, Lucre. **lac**, to obtain. Cfr. *lucrum;* g. *glück;* d. *luk.*
Lud-. **lad**, to frolic, to use the tongue. Cfr. *ludo, laudo.*
Lull. **lul**, to rest in or on; to embrace.
Lumb-, Lump. **lambaꞅ**, large, pendulous. v. Lab-.
Lum-. [*lu(c)men.*] v. Light.
Lump. v. Lop.
Lunge. (*allonger.*) **la‚dȷ**, to strike.
Lup-. v. Wolf.
Luscious, Lust. v. Lascivious.
Lus-. v. Lud-, Light.
Lute. v. Loud.
-Ly. v. Lig-. [diminish.
Lys-, Lyt-. (ana-, eata-, dia-.) **luʹ**, to cut; **luʹf**, to steal; **liɢ**, to
Ma. **maʹ**, a mother.
Mace. **maf**, to strike, to kill. v. Mass. [g. *makrele.*
Mackarel, Mackle, Macle, Maculate. **ma‚c**, to adorn. Cfr. *macula;*
Macro-. **mahaʹn**, great, much; **mahas**, lustre, greatness; **ma‚tf**, to fill; **ma‚h**, to grow, or increase; **mahasa„**, knowledge. Cfr. *μέγας, μακρός; magnus, magister, magus;* goth. *mickels;* ags. *mægn, micel;* sp. *mucho.*

MAD. **mad**, to be intoxicated; **un-mad**, to be insane. Cfr. goth. *ga-maids*; ags. *gemaad*; it. *matto*.

Madder, Madre-. **ma‚d**, to adorn.

MAG-ist-. (Al-magest.) v. Macro-.

Maggot. v. Musquito.

Magic. **ma´ya´**, trick, illusion. [g. *magd*; d. *maagd*.

Maid. **madhya´**, a young woman. Cfr. goth. *magaths*; ags. *mægth*;

Mail. **mal**, to hold, to wear.

MAIN, MAJ-. v. Macro-, Man-, Many.

Make. **ma‚gh**, to begin; **ma‚h**, to grow or increase. Cfr. goth. *magan*; g. *mögen, machen*; d. *mogen, maken*; ags. *magan, macian*. v. Macro-.

MAL-. **malaˢ**, filth, sin; **malinaˢ**, black, vile, foul; **mallaˢ**, strong, robust; the cheek and temples. Cfr. *μέλας, μελαίνω, μολύνω*; *malus, malignus, mala*; goth. *mail, balva*; fr. *mal*. v. Mail.

MALE. **ma´laˢ**, a man.

Mall-. **mall**, to hold, to have. Cfr. *malleus*; sp. *mallo*.

Mamma. **ma´**, a mother, a woman's waist.

MAN, -Min-. **man**, to know, or understand; **mna´**, to learn; **manas**, the mind; **manuˢ**, man; **mantr̥**, a counsellor. Cfr. *μνάω*; *mens, mon-, ho-min-, hu-man-*; goth. ags. g. d. dan. *man*; g. *mensch*, (**manuʃyaˢ**,) *meinen*.

MAN-. **ma´naˢ**, an agent, taking, seizing. Cfr. *manus*; fr. *main*.

Mand- (-ible, -il, -ucate,) Mantle. **ma‚d̥**, to divide, to surround, to decorate. Cfr. *μανδύας*; g. d. *mantel*; ags. *mæntel*; it. sp. *manto*; fr. *manteau*. v. Mend-.

Manger. v. Maw. [

Mania. **manyuˢ**, anger, sorrow.

MANY. **ma‚h**, to grow, or increase. Cfr. *im-man-is*; goth. *manags*; g. *manche*; d. ags. *menig*; dan. *mange*.

MAR. **mr̥´**, to die, to kill, to injure. Cfr. מרע sickness, disease; *μαραίνω*; *marceo, morior*; goth. *marzjan*; ags. *merran*; sp. *marro*.

Marble. **marus**, a desert, sand. Cfr. *μάρμαρος*; *marmor*; d. *marmer*; it. *marmo*; sp. *marmol*; fr. *marbre*. v. Mur-.

March. **ma´rg**, **martʃ**, to go. Cfr. g. *marsch*; d. *mark*; fr. *marcher*; sp. pg. *marchar*.

Margarite. **mandʒari´**, a pearl. Cfr. *μάργαρον*; goth. *markreitus*.

Margin. **marya´**, a boundary.

Marine, Marsh. **mi´raˢ**, the ocean. Cfr. *mare*; goth. *marei*; g. d. *meer*; w. *mor*; sp. *mar*; fr. *marée*.

MARK-. **mṛg**, to seek, to investigate; **mṛç**, to see, to consider. v. Marmor-. v. Marble. [Mareh, Margin.

Maroon. **aruna**ˢ, tawny, dark red.

Martin. v. Mur-.

Marvel. v. Mir-.

Mash, Mas-, Mass. **maʃ**, to injure, to kill; **matʃ**, to pound; **macʃ**, to mix. Cfr. *μάσσω*; *massa*; g. *meischen*, *masse*; fr. *macher*, *masse*. v. Measure.

MASTER. (*magister.*) v. Maero-. [*mith*; g. *mit*; d. *maat*, *met.*

Match. **ma.tʃ**, to shine. [*machus*; g. *magen*; d. *maag*; fr. *manger*, *estomac.*

MATE. **math**, to kill; **meth**, to associate. Cfr. sp. *matar*; goth.

MATER-. v. Mother, Matter. [*μανθ-*. v. Mead-.

MATH-. **medh**, to understand, to know. Cfr. למד a scholar; *μαθ-*,

MATTER. **ma′tr-a′**,-**a**,, requisite, material; the primitive subtle or invisible type of visible elementary matter; **ma′**, to measure. Cfr. *μετρέω*; *metior*, *materia.*

Mattock. **mu.d**, to shave or cut, to grind or pound.

Mature. v. Mead.

Maul. v. Mall-. [*machus*; g. *magen*; d. *maag*; fr. *manger*, *estomac.*

Maw. **bhudJ**, to eat; **ma.tʃ**, to pound or grind. Cfr. *φάγω*; *sto-*

MAX-. v. Mash, Maero-.

May. v. Make. [*moi.*

ME. **ma′**, me. Cfr. *'εμε*; *me*; goth. *mik*; g. *mich*; d. *mij*; fr.

MEAD. **madhu**, honey, spirituous liquor; **madhura**ˢ, sweet; **matta**ˢ, intoxicated. Cfr. *μέθυ*; *maturus*; g. *meth*; d. *mede*; ags. *meda*;

Mead-. **mu.d**, to shave or cut. [dan. *mod.*

MEAL. **malana**,, rubbing, grinding, &c. **mala**,, dirt, sediment. Cfr. *μύλη*; *mola*, *mollis*; goth. *malan*; g. *mahlen*; d. *malen.*

Mean. v. Common, Many, Man, Medium.

Meander. **mi′**, to go or move; **me**, to exchange. Cfr. *meare*, *mutare*, *movere*, *migrare.*

MEAS-. **mas**, **ma′**, to measure; **ma.d**, to divide, to separate; **ma′tra′**, quantity, measure. Cfr. משח measure; מדד to measure; *μετά*, *μετρέω*; *metior*, *modus*, *mensura*; g. *mass*, *messen*; d. *meten*, *maat*; fr. *metre*, *mesure.*

MEDDLE, MEDIUM. **madhya**,, middle, intermediate. Cfr. *μετά*, *μέσος*; *medium*; goth. *midja*; g. *mitte*, *mittler*; d. *midden*, *middelen*; ags. *midel*; sp. pg. *mediano*; fr. *moyen.* v. Meas-.

Meditate. v. Math-.

Medley. v. Mate.

MEDUL-. **mid**, to be greasy; **meda**ˢ, fat.

MEED. **medha**ˢ, oblation, sacrifice. Cfr. *μισθός*; goth. *mizdo*; g.

miethe; ags. *med.* v. Meas-.
Meer. v. Marine.
MEET. v. Mate, Meddle, Meas-.
MEGA-. v. Macro-.
MELAN-. v. Mal-.
MELEE, MELL. **melaꞩ**, assemblage; **mil**, to mix.
Melli-. **madhulih**, a bee. Cfr. *μέλι; mel;* goth. *milith.* v. Mead.
Mellow. v. Meal.
Memento. v. Man.
Memory. **smṛ**, to remember. Cfr. *μερίμνα, μέρμερα; me-mor;* goth. [*merjan.*
MEN-. **mandaꞩ**, sick, lazy, vile; **mad**, to ask. Cfr. *menda, e-mendo, mando, mendico;* fr. *amender, mendier.*
MENS-. **maˊ,saˌ**, flesh; **maˊs**, the moon, a month. Cfr. *μήν, μήνη. mensa, mensis;* goth. *mena, menoths;* g. *mond, monat.* v. Man,
Mer-. v. Marine. [Meas-.
Merc-. v. Mark-.
Mercy. **mṛʃ**, to suffer patiently, to pardon. [merse.
Merge, Mers-. **mrdʒ**, to cleanse; **mrʃ**, to sprinkle; **masdʒ**, to im-
Mes-, Mess. v. Meddle, Misc-, Mens-.
META-. **mith**, to unite; **mithyas**, mutually. Cfr. *μετά, μεταξύ; muto, mutuus;* goth. *mith;* g. *mit.* v. Meet, Band.
Mete, METRE. v. Meas-.
METHEGLIN. v. Mead.
METRO-. v. Mother.
Mew. **muˊ**, to bind, to tie; **mudʒ**, to sound.
Mezzo-. v. Mes-.
Mica. **maˌtʃ**, to shine.
Mickle. v. Macro-.
Mic-turition. **mih**, to sprinkle, to shed; **meghaꞩ**, a cloud; **mehaꞩ**, urine; **muˊtr**, to void urine; **mutʃ**, to let loose, to part with. Cfr. *ὀμιχέω, ὀμίχλη; mictus;* goth. *maihstus.*
MID-. v. Meddle.
Midge. v. Musquito.
Mien. v. Man.
Might. v. Make. [sw. dan. *mild.* v. Meal.
Mild. **mṛduꞩ**, mild. Cfr. *μείλιχος; mollis;* goth. *milds;* ags. g. d.
Mil-, Milit-. **mil**, to mix, to associate; **mallaꞩ**, a wrestler, a boxer. Cfr. *ὁμιλέω, ἅμιλλα, μῶλος; miles, molior, mille.*
Milk. **mṛdʒ**, to cleanse, to purify. Cfr. *ἀμέλγω; mulgeo, mulceo;*
Mill. v. Meal. [g. *milch, melken;* d. *melk-en;* dan. *mælk.*

Milt. v. Mild.

Min-. **manda$**, **mana´c**, little; **mi´**, (**mi´na´ti**,) to injure, to kill. Cfr. *μινύθω*, *μείων*; *minus*, *minutus*; goth. *mins*; ags. *minsian*.

Mind. v. Man.

Mingle. v. Many.

Minnow. **mi´na$**, a fish.

Mir-. **mrg**, to see, to consider; **mari´tʃica´**, the mirage. Cfr. *miror*, *miracalum*; it. *maraviglia*; fr. *merveille*, *miroir*.

Mire. **mṛd**, to trample on, to grind to powder; earth, clay. v. Marine.

Mirth. **mṛd**, to rejoice, to be or make happy.

Mis-. (*μῖσος*.) **miʃa'**, envy. [*missa*; sw. dan. d. *mis*; fr. *mes-*.

Mis-, Miscel-. **misr**, to mix. Cfr. *miscere*, *miscellaneus*; goth.

Mist. **miʃ**, to sprinkle. v. Mict-, Mis-.

-Mit, Mite. **mud**, to quit or leave; **mita**, moderate, few or little. Cfr. *mitis*, *mitto*; dan. *mid*; ags. fr. *mite*.

Mitigate. **mid**, to be soft, to be friendly.

Mix. **misr**, **macʃ**, to mix. Cfr. *μίξω*; *miscere*; g. *mischen*; ags.

Mizzen. v. Meddle. [*miscan*; it. *mischiare*; pg. *mexer*.

Mnem-. v. Man.

Moan. **maṇ**, to sound inarticulately. ags. *mænan*.

Mob. (*mobilis*.) **ma¸b**, to go.

Mod-. v. Mete.

Moiety. (*medietas*.) v. Meddle.

Moist. v. Mist.

-Mol-. v. Meal. [*mola*; fr. *mole*. v. Mal-.

Mole. **mal**, to hold; **mu´l**, to be rooted or firm. Cfr. *μῶλος*; *moles*,

Mon-, Monk. **ma´na¸**, measure in general, whether of weight, length, or capacity. Cfr. *μόνος*, *μοναχός*. v. Man, Un-.

Mong-. v. Many.

Monitor. **mantṛ**, a counsellor.

Month, Moon. v. Mens-.

Moo. (*mugio*.) **mudʒ**, to sound.

Mood. **budh**, to observe, to know; **mud**, to rejoice. Cfr. goth. *mods*; g. *muth*; d. *mœd*; ags. sw. dan. *mod*. v. Mod-.

Moor. v. Amaurosis, Marine, More, Mur-.

Moot. v. Meet.

Mor-. v. Mar. [*marteau*, *mortier*.

Mord-. **mṛd**, to grind, to pound. Cfr. *mordeo*, *mortarium*; fr.

More. g. *mehr*; d. *meer*; dan. *meere*. v. Macro-.

-More. (Sepho-,) Morose. **muhera$**, a blockhead, a fool. Cfr.

Morgue. **ma´rg**, to seek. [*μωρός*; *morosus*.

Mors-, Mortar. v. Mord-.

Mosaic. **mus**, to cut, or break to pieces.

Most. v. Macro-.

Mot-. v. Mouth.

MOTHER. **ma′tr̤**, a mother, the earth. Cfr. *μάτηρ, μήτηρ, μήτρα*; *mater, matrix*; g. *mutter*; d. *mœder*; ags. sw. dan. *moder*; it. sp. pg. *madre*.

Motion, Move. **me**, to exchange, to return. Cfr. *'αμείβω, μοῖτος*; *meare, mov-, mot-, mom-, mut-*. [See Curtius, p. 287.]

Mould. v. Meal, Mud.

MOUSE. **mu′ſaˢ**, a mouse. Cfr. *μῦς*; *mus*; russ. *mishe*; g. *maus*. d. *muis*; dan. sw. ags. *mus*.

Mouth. **put̤**, to speak. Cfr. *μῦθος*; goth. *mathlei, munths*; g. dan. *mund*; d. *mond*; ags. *muth, mæthelan*; it. *motto*; sp. pg.

Mow, Much. v. Macro-, Mead-. [*mote*; fr. *mot*.

Mucil-, Muck, Mucus, Muggy. v. Micturition.

Mud. **mṳd**, to grind or pound; **mid**, to liquefy, to be soft; **mud**, to mix; **mr̤d**, earth. Cfr. *μυδάω*; *madeo*; g. *moder*; d. *modder*.

Muff-. **mav**, to bind, to tie. Cfr. g. sw. dan. *muff*; d. *mof*.

Mul-. **mil**, to mix, to associate. v. Meal.

Munch. v. Maw. [*ditia*.

MUND-. **mṳd**, to be pure, to cleanse, to sink. Cfr. *mundus, mun-*

MURAL. **mur**, to surround, to bind together. Cfr. *murus*; w. *mur*.

MURDER. **mr̤′**, **mr̤dh**, to kill. Cfr. *μορτός*; *mors*; goth. *maurthr*; ags. *morth-er*; g. dan. sw. *mord*; d. *moord*; it. *morte*; fr. *meurtre*. [it. *mormorare*; sp. pg. *murmurar*; fr. *murmurer*.

MURMUR. **marmaraˢ**, a rustling sound. Cfr. *μορμύρω*; *murmuro*;

MURRAIN. **marana„**, death, dying. v. Mar.

Mus-. **maǧ**, to sound, to be angry; **mr̤ǧ**, to deliberate. Cfr. *μύζω, μοῦσα*; *musso, musa, musica*; fr. *muser, musique*. v. Mash.

Mush. v. Mash. [sp. pg. *musquito*.

MUSQUITO. **maǧacaˢ**, a musquito; **mitſh**, to torment. Cfr. *musca*;

Muss. **maǧ**, to be angry. v. Mash.

Must. **mastuˢ**, whey. [*moustache*; sp. *mostacho*.

Mustache. **mastacaˢ**, the head. Cfr. *μύσταξ*; it. *mostacchio*; fr.

Mute, Mut-. **mu′**, **ba̤dh**, to bind; **mu′caˢ**, dumb. Cfr. *μυκός, μύδος*; *mutus*; it. *muto*; fr. *muet*; sp. *mudo*. v. Motion, Meta-,

Mutilate. **muſ**, to break. [Meet.

Mutter. **ma̤tr̤**, to speak privately. v. Muse.

Muzzle. v. Mouth.

Mynchery. v. Mon-.

My-. (*μύω, μυέω, μυστήριον.*) v. Mute.

Myth. v. Mouth.

Nadir. v. Under, Nether.

Nag. **nach**, to go. v. Equ-.

Naiad. **nay**, to go.

NAIL, -NACULUM, (Super-.) **nachaˢ**, a finger nail; **nal, nah**, to bind, to tie. Cfr. *ὄνυξ*; *unguis, ungula*; goth. *ga-nagljan*; og. *nagal*; ng. d. sw. *nagel*; ags. *nægel.*

Naked. **nagnaˢ**, naked. Cfr. goth. *naqvaths*; g. *nackt*; g. *naakt*; ags. *nacod.* (**cat**, to cover or screen; **guth, gud**, to surround.)

Nakir. v. Nec-.

NAME. **na´man**, a name. Cfr. *ὄνομα*; *nomen*; goth. *namo*; g. *name*; d. *naam*; ags. *nama*; it. pg. *nome*; fr. *nom*; pers. *nam.*

Narrow, Near. **nediyaˢ, nicafa´, nicataˢ**, near; **nah**, to bind or tie; **upa-ni´, nacf**, to approach. Cfr. goth. *nehra*; g. *nahe*; d. *naaken, naauw*; ags. *neara, neah, nealig.*

NAS-, NAZE. v. Neese.

Natant. **nat**, to beat, to strike; **nay**, to go.

NAU-, NAV-. **nauˢ**, a boat. Cfr. *ναύς*; *navis.*

NAVE-l. **na´bhiˢ**, the nave of a wheel, the navel, **na´bhi´la**,, the hollow of the navel. Cfr. *ὀμφαλός*; *umbilicus*; g. *nabe-l*; d. *navel*; ags. *nafa, nafela.*

NEAT. **ni´taˢ**, correct, modest; **nu´taˢ**, new. Cfr. *nitidus*; w.

NEBUL-. v. Nephel-. [*nith*; it. *netto*; fr. *net.* v. Nit-.

Necessity, Neck. **nah**, to bind or tie; **nach**, to move. Cfr. *ἀνάγκη*; *necesse*; ags. *hneca*; g. *nacken*; d. *nek*; it. sp. pg. *nuca.*

NECRO-. **nacc, naç**, to destroy, to perish. Cfr. *νέκυς, νεκρός*; *nex, noceo, neco*; goth. *naus.* [d. *nood*; ags. *neod.*

NEED. **na´th, na´dh**, to ask or beg. Cfr. goth. *nauths*; g. *noth*;

Needle. (goth. *nethla*; ags. *nædl.*) v. Net.

NEESE, NESS. **nas, na´sa´**, the nose. Cfr. *nasus*; g. *nase, nieseln, niesen*; d. *neus, niezen neuzelen*; ags. *nese, niesan*; fr. *nez*;

Negro. v. Night. [it. *naso.*

Neigh-bor. v. Near. [*νεφέλη*; *nubes, nebula*; og. *nibul.*

NEPHELIN. **nabhaˢ**, a cloud; **nabholayaˢ**, smoke. Cfr. *νέφος*,

NEPHEW, Nepo-. **naptṛ**, a grandson. Cfr. *νέποδες*; *nepos*; it. *nipote*; fr. *neveu*; g. *neffe*; d. *neef.*

NEREID. **na´ra´**, water. Cfr. נהר a river; *νηρεύς.* [fr. *nerf.*

Nerve. **nṛ**, man; **nṛ**, to lead, to guide. Cfr. *νεῦρον*, *ἀνήρ*; *nervus*;

Nest. **ni´daˢ**, a nest. Cfr. *nidus*; fr. *nid*; g. d. ags. *nest*; it. sp. *nido.*

NET. **nah**, (**nahyati, naddha´**,) to bind or tie. Cfr. *νέθω*; *nodus*;

goth. *nati;* g. *netz, knoten;* d. *net, knod;* ags. *net, cnyttan.*

v. Neat. [*nieder;* d. dan. *neder.*

Nether. **nad̠**, to fall off or from; **natas**, bent, reclining. Cfr. g.

Neur-. v. Nerve.

New, Neo-. **navas**, new. Cfr. *νέος; novus, nuper, nuntius;* goth. *niujis;* g. *neu;* d. *nieuw;* ags. *neow;* fr. *neuf.*

Nex-, Next. v. Net, near.

Niche, Nick. **ni**, in; **tſho**, to cut; **nitſitas**, covered, overspread. Cfr. it. *nicchia;* sp. pg. *nicho;* fr. *niche;* g. *nicken;* d. *knik.*

Nid-. v. Nest.

Nig-, Nigh. v. Near.

Night, Nigr-. **nig̠** (**nit̠**,) **nacta**,, night. Cfr. *νύξ; niger, nox;* goth. *nahts;* g. *nacht;* d. *nagt;* ags. *niht.*

Nimble. **namb**, to go.

Nimbus. v. Nephel-. [*neun;* d. *nigen;* ags. *nigan;* sw. *nijo.*

Nine, Non-. **navan**, nine. Cfr. *nonus, novem;* goth. *niun;* g.

Nit-. **nat̠**, to shine, to dance. Cfr. *nitor, nitidus.*

Niv-. **ni̠v**, to moisten, to sprinkle. v. Snow.

No, Nay, Ne-, Non-. **na′**, no. Cfr. *νη-; ne-, ni-, nec, non;* goth. *ni;* g. *nicht;* fr. *non;* ags. *na, ne.*

Nocent. v. Necro-.

Noct-, Nyct-. v. Night. [*nuto.*

Nod. **nat̠**, to shake, to move slightly. Cfr. נוד to shake, to tremble;

Nod-, (*nodus,*) Noose. v. Net.

Nom-. **nam̠**, to bow in homage or worship, to sound. v. Name.

Nook, Notch. v. Niche.

Noon. v. Nine.

North. **nr̠**, to guide; **nr̤d̠**, to sound; **na′ra′**, water.

Nose, Noz-. v. Neese.

Noso-. v. Necro-.

Note. v. Know.

Noun, -Nounce, -Nown (re-.) v. Name.

Nov-. v. New, Nine. [d. sw. dan. *nu.* v. New.

Now. **na′**, **na**,, same, like; **nus**, time. Cfr. *νῦν; nunc;* goth. g.

Nox-, Noi-, Noy-, Nuisance. v. Necro-.

Nub-. v. Nephel-.

Nun-. v. Nine, -Nounce. [*ϝω;* O.

O. **o**, an interjection of calling, reminiscence, or compassion. Cfr.

Oak. **och**, to adorn. **vacſ**, to increase. Cfr. g. *eiche;* d. *eik;* ags. *ac, aec.* v. Eke.

Oar. (ags. *ar.*) **r̥**, to go. v. Rem-.
Oasis. **vas**, to dwell or inhabit, to clothe.
Oat. v. Eat.
Oath. **a.d**, **a.t**, **i′.t**, to bind. Cfr. goth. *aiths;* g. *eid;* d. *eed;* ags. *ath.*
Ob. v. Ep-.
Obed-, Obey. **abhi-vad**, to salute respectfully; **vidheyaˢ**, compliant.
Ob-scure. v. Sky.
Ocean. v. Eke.
Ochre. **harisˢ**, tawny, green. Cfr. *ὠχρός; ochra;* fr. *ocre.*
Oct-, Ogdo-. v. Eight.
Ocul-, Ocell-, Oeil-, Ogle. v. Eye.
Odd, -s. **va.ḍ**, to divide. [*ἀείδω; oda, ode.*
Ode. **vad**, to speak; **i′ḍ**, to praise, to celebrate. Cfr. *ᾠδω, ᾠδή,*
Odium. v. Hate.
Odont-. v. Dainty.
Oeco-. v. Eco-.
Of, Off. v. Ab.
Oft. v. Aft-.
Ogre. **ugraˢ**, cruel, fierce, savage. [*οἶδα.*
-Oid. **vid**, to know, to describe, to be fixed or steady. Cfr. *εἴδω,*
Oil, Ole-, Olive. **ulca′**, fire; **li.p**, to smear; **lavaṇa′**, light, lustre. Cfr. *ἔλαιον; oleum, oliv-;* goth. *alev;* g. *öl;* d. *olij;* ags. *œl;* fr. *huile.* [fr. *oindre, oint.*
Oint. **a.dJ**, (**a.cta′**,) to anoint. Cfr. *ungere, unctum;* sp. pg. *untar;*
Oker, Okra. v. Ochre.
Old, -Olete, -Olescent. **al**, to be competent or able. Cfr. אל protection, אול strength; *ἄλδω, ἀλκή; alo, oleo;* g. *alt;* d. *oud;* ags. *cald.*
Olig-. **lu′**, to cut; **liç**, to lessen. Cfr. *ὀλίγος, ἐλάσσων;* ags. *læs.*
Omphal. v. Umbil-. [goth. *ana;* g. *an;* d. *aan.*
On. **aṇiˢ**, a limit, a boundary; **antar**, within. Cfr. *ἐν, ἄνω; in;*
One. v. Un-.
Onoma-. v. Name.
Onych-, Onyx. v. Nail.
Oo-. v. Egg.
Ooze. v. Issue.
Open. v. Up, Over. [**ibhyaˢ**, opulent.
Opi-, Opt-, Opu-. **a′p**, to obtain; **ibh**, to accumulate; **ibhaˢ**, best;
Oper-, **pṛ**, to labor. Cfr. *περάω; operor, ops.*
Optim-. **uttamaˢ**, best.

Option. v. Pet-. [*aiththau ; g. oder ; ags. other.*

Or. **utaꞅ**, a particle of deliberation. Cfr. *αὐτάρ, αὖτε ; aut ;* goth.

Orange. **surangaꞅ**, the orange. Cfr. *aurantium, syringa.* v. Gold.

Or-, Orat-. **ru, rat**, to speak, to sound ; **ṛ**, to attack, to arouse. Cfr. *ᵛορω ; oro, orator, oraculum.* [*orbo, rapio.*

Orb-, Orphan. **ru′p**, to form ; **ri′v**, to take. Cfr. *ᵓορφανός ; orbis,*

Orchard. **ṛdh, vṛdh**, to increase, to grow. Cfr. *ʷριζα ; hortus ;* goth. *vaurts, aurti-gards ;* og. *wurz ;* ng. *wurzel ;* ags. *vurt, ort-geard.*

Orchestra. **rach, ṛdȷ**, to go, to move. Cfr. *ᵓορχέομαί; ᵓορχήστρα.*

Ord-, Ortho-. **urd**, to measure ; **ṛdh**, to augment, to please ; **ra′dh**, to complete, to be right ; **hruḍ**, to collect. Cfr. *ʷραδιος, ᵓορθός ; ordo, ordino ;* pers. *radah ;* goth. *ga-raids, raidjan, raihts ;* ags. *hrad, gerad ;* g. *bereit ;* d. *reeden, bereid ;* fr. it. sp. sw. dan. g. ir. russ. *ord-.*

Organ, Org-, Orig-. **ṛdȷ**, to be strong ; **vradȷ**, to prepare ; **ratſ**, to work, to make ; **ṛ**, to attack, to excite, to go ; **u′rdjaꞅ**, effort, exertion. Cfr. *ᵛεργον, ᵛοργανον, ᵓοργή ; origo, urgeo, organum ;* goth. *vaurkjan ;* g. d. *werk ;* ags. *wircan.* [*orno, urna.*

Orn-. **u′rnu**, to cover, to conceal ; **varṇ**, to color. Cfr. *οὐράνος ;*

Oro-. **giriꞅ**, a hill. Cfr. *ᵛορος ;* slav. *gora.*

Os-. **aḡ**, to eat. [*ostrea.*

Osteo-, Ostra-. **asthi**, a bone. Cfr. *ᵛοστρεον, ᵓοστέον ; os, osseus,*

Other. **antara„ itaraꞅ**, other, different. Cfr. *ʷετερος ; alter, itero ;* goth. *anthar ;* g. *ander, oder ;* ags. *other ;* fr. *autre ;* sp. *otro.*

Otter. **udraꞅ**, an other. Cfr. *ʷυδρος, ᵛενυδρις ; lutra ;* g. d. ags. *otter ;* sw. *utter ;* it. *loutra ;* fr. *loutre.* v. Water.

Ourano-. v. Orn-.

Oust, Out. **vahis, ut**, out, outwards. Cfr. *ᵛετι ; ultra ;* goth. *us, ut ;* g. *aus ;* d. *uit ;* ags. sw. *ut ;* dan. *ud ;* fr. *oter, outrager, outré.*

Ov-. v. Egg.

Ovation. **a′-vad**, to celebrate.

Oven. **tfu′r, uſ, av**, to burn ; **agniꞅ**, fire. Cfr. כור a furnace ; *κλ-* or *κρ-ίβανος, αὔω ;* goth. *auhns ;* sw. *ugn ;* ags. g. *ofen ;* d. *oven.*

Over. **upa, upari**, upon, above. Cfr. *ʿυπέρ ; super, aperio ;* goth. *ufar ;* og. *oba ;* ags. *ab-ufan ;* g. *über ;* d. dan. *over ;* fr. *ouvert.*

Ovine. v. Ewe.

Owe, Own. **aḡ**, to receive ; **i′ḡ**, to possess. Cfr. *ᵛεχω ;* goth. *aigan ;* ags. *agan, agen ;* dan. *egen ;* g. d. *eigen.*

Owl. **ulu′caꞅ**, an owl. Cfr. *ᵓολολυγμός ; ululare ;* ags. *ula ;* g. *eule ;* d. *uil ;* sw. *ugla.* [d. *os ;* sw. dan. *oxe.*

Ox. **ucſan**, an ox or bull. Cfr. goth. *auhsa ;* ags. *oxa ;* g. *ochse ;*

Oxy-. (*ὀξύς.*) **acf**, to pervade.

Oyster. v. Osteo-.

Pa-. **pa′**, to nourish. v. Feed.

Pac-. v. Peace.

PACE, PAD. **pat**, **path**, **pad**, **pas**, to go, to move; **pad**, to heap together; **pad**, a foot; **pathin**, a road, a way. Cfr. *πατέω, πάτος, πέδον, πέζα, πούς, πέτομαι*; *peto, pes, pedester, passus, spatior*; it. *passo*; sp. *paso*; fr. *pace, pas, passer*; g. *pass*;

Pacha, Padisha. v. Bashaw. [d. *pas, pad.* v. Foot.

Pack, Pact. v. Bag.

Pæd-. v. Puerile. [*pagina*; fr. *page.*

Page. **patf**, to spread; **pacfaˢ**, a side; **pa.dʒi′**, a journal. Cfr.

Pail. **pu′l**, to collect. Cfr. *πέλλα.*

PAILLASSE. **palaˢ**, straw. Cfr. *palea*; fr. *paille, paillasse.*

Pain. **pu.th**, to hurt, to suffer pain; **van**, to serve, to be distressed; **pain**, to grind; **pu.s**, to punish, to pain. Cfr. *πένθος, πόνος, πένης, πένομαι*; *pœna, penuria*; ags. *pin, pine*; g. *pein*; d. *pijn*; fr. *peine.* [*peindre.*

PAINT. **pi.dʒ**, (**pi.cte,**) to dye or color. Cfr. *pingo, pictus*; fr.

Pair. **paraˢ**, more, other, different; **pr′**, to fill; **para′**, back. Cfr. *παρά*; *per, par*; sp. pg. g. sw. arm. fr. *par*; g. d. *paar*; fr. *pair.*

PALACE. **palliˢ**, a house, a village. Cfr. *πόλις*; *palatium*; g. *pfalz*; it. *palazzo*; fr. *palais.*

Pal-adin. **pall**, to go.

Palanquin. **palyancaˢ**, a bedstead.

Pale, Paleo-, Pall. **palitaˢ**, old, grey-haired. Cfr. *παλαιός, πολιός*; *pallidus*; fr. *pale.* v. Pole, Fail, Pale, Veil.

PALEACEOUS, Paleous, Pallet. v. Paillasse.

Palestra. **pil**, to throw. Cfr. *πάλη*; *pello.*

Palsgrave. v. Palace.

Palsy. v. Para, Lys-.

Pamper, Pan-, Panada. **panaˢ**, the bread-fruit tree; **pa′**, to drink. Cfr. *panis, bibo*; it. *pane, bere, pambere.* [**pan**, to praise.

Pan-, Pander. **pand**, to accumulate; **pandaˢ**, an eunuch, a catamite;

PANDIT. **panditaˢ**, a scholar, a teacher.

Pang. v. Pain.

Panic. **pa.d**, to go, to heap together, to destroy; **pannaˢ**, falling. Cfr. *πανικός*; w. *pannu*; it. sp. *panico*; fr. *panique.*

Pansy. fr. *pensée.* **man**, to think.

Pap, Papa. **pa′**, to drink, to nourish, to protect; **papus**, a nurse, a

protector. Cfr. *πάομαι, πάππας; papilla;* it. *pappa, papa;* g. [d. fr. sp. *papa.*

Par, Para. v. Pair.

Par-, Parade. **pṛ´**, to fill, to please, to protect, to labor. Cfr. *parcus, parsimonia, paro;* it. *parata;* sp. *parada;* fr. *parade.*

Paradise. **paruṣ**, Paradise. Cfr. פרדס a pleasure-garden; *παράδεισος.*

Par-cel. v. Part.

Parch. **bhṛdʒ**, to parch, to fry.

Pardon. v. Per-, Don-.

Parent. v. Bear.

Parget. **pṛtʃ, pṛdʒ**, to touch, to be in contact with, to paint.

Parry. **para´**, backward.

Par-see. v. Pyr-.

PART. **pṛthac**, separately; **pari**, a prefix, implying part. Cfr. *pars;* fr. *part;* sp. it. *parte.* v. Brittle. [*perdiz;* fr. *perdrix.*

Partridge. **pard**, to break wind. Cfr. *πέρδω, πέρδιξ; perdix;* sp.

Pas, Pass, Passion, Passive. v. Pace, Patience, Push.

PASTE. **pust**, to bind, to smear; **piftac**, kneaded. Cfr. *πάσσω, παστός; pistor, pastillus, pastino;* it. sp. *pasta;* it. *pastiglia;* fr. *pastille.*

Past-or, -ure. **puʃ**, to nurture; **bhacʃ**, to eat. Cfr. *βόσκω; pasco.*

Pat. **pat**, to fall, to alight. **pathyaṣ**, suitable. Cfr. *πίπτω;* g. *pass;* d. *pas;* w. *pat.* v. Pace.

Pat-en, -ent. **pat**, to move, to encompass; **paṭaṣ**, a screen of cloth; **patra**, a leaf. Cfr. *πλατύς; pateo, patera, patina.*

PATERNAL, PATR-, PARRI-. v. Father.

PATH, Patrol, Patten. v. Pace.

Path-, Pati-ence. **pat**, to be powerful. Cfr. *πάθος; potens, patior.*

Patois. **put, paṭh**, to speak. Cfr. *peto, petitio.*

Paunch. **paṇtʃ**, to spread; **puṇdʒaṣ**, a collection.

PAUPER. **pa´paṣ**, vile, abandoned, profligate. Cfr. *pauper;* sp. *pobre;* fr. *pauvre.*

Pause. **pas**, to obstruct. Cfr. *παῦσις; pausa;* fr. g. dan. *pause.*

Pav-. **pay**, to go; **vi-pay**, to spread. Cfr. *pavo;* w. *paw.*

Paw. v. Pace.

Pawl. v. Pole.

Pawn. **pa´ṇaṣ**, trade, traffic; **paṇaṣ**, price, a wager. Cfr. *pendo, pensio;* g. *pfennig, pfand;* d. *penning, pand;* ags. *penig, bad.* v. Bet, Bind, Peace. [*pagar;* fr. *payer.*

Pay. **piṇdʒ**, to impinge, to give. Cfr. *παίω;* it. *pagare;* sp. pg.

Peace. **paǧ**, to bind, to tie, to move. Cfr. *πηγός; pactio, pax, pecten, pectus, piguus;* fr. *paix.*

-Peach, (im-.) **paˌtf**, to make evident, to state fully.

Peak. **pitftf**, to cut, to divide. Cfr. *πέκω*; *peeten, pecto*; ags. ir. *peac*; fr. *pique*; sp. *pico*; it. *becco*; g. *picken*; d. *pikken*.

Peal. **pil**, to throw, to east or send; **pi'l**, to prohibit, Cfr. *βάλλω*;

Peek, Pee-. v. Peak. [*pello, balo*. v. Bleat.

Peeker, Pica. **picaˢ**, the Indian euckoo.

Pecu-. **paguˢ**, an animal. Cfr. *πῶυ*; *pecu, pecul-*. v. Fee.

Ped-. v. Pace, Speed.

Peddle. v. Pet-.

Peel. **bil, bhil**, to tear, to detach. Cfr. *pilo*; sp. *pelar, pillar*; fr. *peler, piller*. v. Peal, Fell.

Peer. v. Par.

Peg. v. Bag, Peace.

Peir-. **pr**, to make exertions. Cfr. *πειράω*. v. Experience.

Pel-, Pell-, Pelt. v. Peel, Ball. [*pinan*.

Pen. (v. Feather.) **pen**, to go, to embrace, to grind. Cfr. ags.

Pen-. v. Pain, Paint.

Pend-, Pennant. v. Banner.

Penny, Pension. v. Pawn.

Pensive. v. Pansy.

Pent-. v. Five, Pend-.

Penury. v. Pain. [*πλοῦτος*; *plebes, po-pulus*. v. Fill.

People. **pu'l**, to accumulate; **pr**, to fill. Cfr. *πλήρης, πλέως, πληθύς*,

Pepper. **pippali'**, pepper. Cfr. *πέπερι*; *piper*; ags. *pepor*; g. *pfeffer*; d. *pepper*; fr. *poivre*. [*πέψις, πεπτικός*.

Peptic. **patf**, to cook, to ripen; **pa'tfacaˢ**, digestion. Cfr. *πέσσω*,

Per, Peri, -Pire. **pr**, to complete; **pari**, a prefix of ubiquity, encircling, diffusion, &e. Cfr. *περί*; *per*. v. Emperor.

Pereh. **prtf**, to toueh, to eome in contact, to restrain.

Peril. v. Peri, Coil, Peir-.

Pert. **pr**, to delight; **pr'**, to fill, to satisfy. v. Peir-.

Pesade. v. Pace. [fr. *pessaire*.

Pessary. **pas**, to bind, to tie, to obstruct. Cfr. *pessus*; it. *pessario*;

Pest, Pester, Pestle. **pas**, to obstruct, to injure or kill; **pif**, to grind, to pound. Cfr. *pestis, pistillum*; it. *peste*; fr. *peste, pester*.

Pet-. **pat**, to surround or encompass; **patuˢ**, blown, expanded; **pat**, to go, to move; **put**, to be or become small; **veth**, to ask. Cfr. *πόθος, πετάω, πέταλον*; *peto, impetus, pateo*; fr. *petale, petit*. v. Pace, Bid, Feather.

Peteechiæ. **pati'ˢ**, yellow.

Pha-, Phan-, Pheno-, Phas-. **bha′**, to shine, to be luminous or beautiful. Cfr. *φάω, φαίνω, φάρος.*

Phag-. **bhadʒ**, to possess, to enjoy; **bhacʃ**, to eat. Cfr. *φάγω.*

Phal-. **phal**, to divide, to split. Cfr. *φάλαγξ.*

Phasis, (apo-, em-.) **bhaʃ**, to speak.

Phil-. **pri′**, to love; **pa′l**, to preserve or protect.

Phlegm, Phlog-. **bhla′ɢ**, to shine. Cfr. *φλέγω, φλέγμα, φλογίζω.*

Phon-. **bhan**, to speak. Cfr. *φωνή.* v. Sound.

Phor-. v. Bear.

Phos-, Phot-. v. Pha-.

Phosphorus. **bha′svaraˢ**, shining.

Phthong. (a-, di-, tri-.) **bhat**, to speak; **dhvan**, to sound. Cfr. *[φθόγγος, φάτις.*

Phyl-. v. Flower, Pel-, Phil-.

Phys-, Phyt-. **bhu′**, to be, to become. Cfr. *φύω, φύσις, φυτόν.*

Physic. **bhiʃac**, a physician.

Piazza. v. Plat-.

Pica. v. Pecker.

Pick. v. Peak.

Pict-. **piɢ**, to shape, to decorate. Cfr. *ποικίλος; pictura.* v. Paint.

Pid-. v. Pet-.

Pie. v. Paste, Pecker, Pict-.

Piece. **piɢ**, to be reduced to constituent parts; **piʃ**, to bruise to powder. Cfr. פס a piece, פשח, to cut or hew in pieces; it. *[pezzo;* sp. *pieza;* fr. *pièce.* v. Peak.

Pier. v. Bear.

Pierce. **prtʃ**, to touch; **prth**, to throw or cast; **prʃ**, to hurt or injure. Cfr. fr. *percer.*

Piety. **pu′dʒ**, to reverence; **pi.dʒ**, to adore. Cfr. *pius, pietas;* sp. it. pg. *pio;* fr. *pieux, pieté,;* it. *pietà;* sp. *piedad.*

Pig. **pi.ga.**, a young animal; **puccasaˢ**, low, vile.

Pigeon. (it. *piccione;* fr. *pigeon.*) v. Pecker.

Pight, Pike. v. Peak.

Pigment. v. Paint. *[πυγμαῖος.*

Pigmy. **pacʃ**, to take or accept; (**vacaˢ**, a crane.) Cfr. *πύξ; πυγμή;*

Pigno-. v. Peace.

Pile,- Pil-. **pil**, to cast or send; **pal**, to go; **pu′l**, to collect; **pul**, to be heaped up. Cfr. פ·ל a post; *πόλεμος, πύλη, πῖλος; pila, palus, palor;* g. *pfahl, pfeiler;* d. *paal, pijl, pijlaar;* it. sp. *pila;* sp. *pilar, pillaṙ;* fr. *pile, pilier, piller.* v. Pel-.

Pimple. **piplusˢ**, a freckle, a mark.

Pincers, Pinch. (fr. *pincer.*) v. Piece, Peace.

Pine, Pinguid. **pi´na$**, fat. Cfr. *πῖος, πίτυς; pinus;* sp. it. *pino;*
Pinge. v. Pay. [fr. *pin.* v. Pain, Pen.
Pinion, Pinnate. v. Pen.
Piquant. v. Peak.
Pirate. v. Peir-.
Pirouette. v. Vort-. [Cfr *piscis;* fr. dan. *pisser;* g. d. *pissen.*
Pis-. **pis, piſ**, to go or move; **bis, vis**, to throw or send, to put forth.
Pist-, Pistil. v. Paste, Pest. [ags. *pyt.*
Pit. **puṭa$**, a shallow concavity; **pat**, to fall. Cfr. *puteus;* d. *put;*
Pitch. v. Fadge, Peak.
Pittance. v. Petty. [fr. *pitié.* v. Piety.
Pity. **piṭh**, to feel pain or affliction; **pi´ḍa´**, pity. Cfr. *patior;*
Pix. v. Box. [content. Cfr. *placare, placere.* v. Bless.
Plac-. **pluſ**, to be fond of or kind to; **pṛ**, to satisfy, to please or
Plaec. (g. *platz;* d. *plaats;* sp. *plaza;* it. *piazza;* fr. *place.*) v.
Plag-. v. Blow, Lay. [Lay, Plat-.
Plaice. v. Plat-.
Plain, Plan-. **plu**, to go. Cfr. *πλανάω, πέδον, πεδινός; planus;* sp.
Plaint. v. Blow. [pg. *plano;* fr. g. sw. *plan.* v. Pace.
Plait. **pli´, plu, plih, preſ**, to go; **prṭſ**, to touch, to join. Cfr. fr. *plisser;* w. *pleth;* dan. *fletter.* v. Plec-.
Plash. **pluſ**, to be moistened, to sprinkle.
Plasm, Plaster. **plus**, to distribute. Cfr. *πλάσμα, ᵛεμπλαζρον; emplastrum;* it. *impiastro;* g. *pflaster;* d. *pleistre;* sw. dan. *plaster;* fr. *platre.*
Plat-. **pa´tra$**, a vessel. (*patera.*) v. Broad, Ball.
Plaud-. v. Loud.
Pleas-. v. Plac-.
Plebeian, -Plement, Plen-, Pleo-, -Plete, Pleth-. **pṛ´**, to fill; **pul**, to become great; **pu´l**, to collect; **pu´rna$**, full. Cfr. *πλήθυς; plebes, populus;* goth. *fulls;* og. *folc.* v. Fill.
Plec-, Pledge, Plex-, -Plevy, Pli- Plic-, -Pliec, Plight, -Plish. **prṭſ, prḍȷ**, (**prṭa$,**) to touch, to mix. Cfr. *πλέχω, πλοχή, δίπλαξ; plecto, amplector, plico, duplex;* ags. *pliht-an;* g. *pflicht;* d.
-Plode. v. Loud. [dan. *pligt;* fr. *pleige;* it. *piegare.* v. Plait.
Plot. v. Plat, Plait.
Plough. **plava$**, leaping, jumping, tumbling. Cfr. g. *pflug;* d. *plœg;* dan. *plov;* ags. *ploge;* ir. *ploy.*
-Ploy, (em-, de-.) v. Plec-.
Pluck. **lu,tſ**, to pluck up, to cut, to pare or peel. Cfr. fr. *eplucher;* g. *pflucken;* d. *plukken;* ags. *lyccan, aluccan, pluccian.*

Plug. v. Plag-.
Plume. v. Ply.
Plump. v. Lumb-.
Plunder. **lu̯t, lu̯d**, to steal. Cfr. g. *plündern;* d. *plunderen.*
Plunge. v. Lunge.
Plural. v. Fill.
Plush. v. Pile, Fleece.
Pluvial, Ply. v. Float, Plait. (Sup-ply. v. Fill.)
Poach, Pocket. v. Bake, Pack.
Pocul-. v. Pap, Culvert.
Pod-. **pa̯t**, to surround; **pa̯d**, to collect. v. Pace, Potent.
Pœcil-. v. Pict-.
Poem. v. Fac-. [fr. *point.* v. Peg.
Point. **pi̯dȷ**, to impinge; **bha̯dȷ**, to break. Cfr. *pungo, punctum;*
Poke. v. Pack, Push.
Pol-. v. Fill.
Pole. **pallavaˢ**, a shoot, a branch; **pul**, to be lofty or high; **pall**, to go. Cfr. *πέλω, πολέω, πόλος; polus, palus;* g. *pfahl, pol;* d. *paal, pool;* fr. *pole.*
Polem-. v. Pile.
Police. **puriˢ**, a city. v. Palace. [*polissant.*
Polish, Polite, Poll. **palyul**, to cut. Cfr. *polio, politus;* fr. *polir,*
Poll. **pulaˢ**, bristling.
Polt. v. Ball.
Poly-. v. Pale, Fill.
Pom-. **paʹ**, to drink, to nourish.
Pond. **pa̯d**, to accumulate; **pa̯t**, to encompass, to portion, to dis-
Pont-. [*po(n)s.*] v. Pace. [tribute; **pat**, to fall. v. Pen, Bind.
Pool. **palvalaˢ**, a small pond; **palala**„ mud, mire; **bul**, to dive; **puʹl**, to accumulate. Cfr. *πηλός; palus;* w. *pwll;* g. *pfuhl;*
Poor. v. Pauper. [d. *pœl;* ags. *pol, pul.*
Pope. v. Papa.
Popul-. v. People.
Por-, Port-. **pr**, to be busy. v. Far, Bear.
Pos-. **puſ**, to divide, to distribute. Cfr. *πόσος; positus.* v. Put, Fast.
Pot. **paʹtraˢ**, an earthen vessel; **putaˢ**, a cup, a concavity; **put**, a hell to which the childish are condemned. Cfr. *πίθος;* g. *pott;* d. w. fr. *pot.*
Pot-. **paʹ**, to drink; **pat**, to be powerful; **patiˢ**, a master. Cfr. *πόσις, πότνια, δεσπότης; potior, potens.* (De-pot. v. Put.)
Potch. v. Pack, Push.

Pother. v. Bother.

Pouch. v. Bag.

Poudr-, POUND, Powder. **pu̯d**, to grind, to pound.

Poverty. v. Pauper. [*poder*; fr. *pouvoir*.

Power. **pat**, to be powerful. Cfr. *potentia*; it. *podere*; sp. pg.

Pr-. **pṛ**, to be busy or active, to nourish, to protect, to please. Cfr. *πράσσω, πρᾶγμα*; sp. *practica*; it. *pratica*; fr. *pratique*.

Præ-. v. For.

Praise. **praǥa̯sa´**, praise. [ags. *ræd*.

Prate. **rut, rat**, to speak. Cfr. *φράζω*; sw. *prata*; d. *praaten*;

Prav-. (*pravus*.) **pravaṇaˢ**, crooked, decayed.

Pray, Preach, Prec-. **pratʃtʃh**, to ask or inquire; **pra-vatʃ**, to teach, to expound. Cfr. *precor, rogo, præco*; it. *pregare*; w. *preg*; g. *fragen, sprechen*; d. *vraagen, preeken*; fr. *prier, precher*.

PRE-. v. For.

PREM-. v. First.

Presby-. (*πρεσβυς*.) **prabhuˢ**, strong, able, eternal.

Pretty. **pri´**, to please, to satisfy, to be pleased or satisfied; **prati**, towards, a little. Cfr. dan. *prydet*; sw. *prydd*; w. *pryd*; ags. *prætc, pryt, pryde*; d. *pret*. v. Pride.

Pred-, Prey. **radh**, to injure or kill.

Previous. **pu´rvaˢ**, previous.

Prick. **prtʃ**, to touch, to restrain.

Pride. **prḍ**, to delight. v. Pretty.

PRIM-, PRIN-, PRIOR, PRO-. v. First.

Priv-. v. Rap-.

Proa. v. Prow.

-Proach. v. Prick. [*proprius*.

Prob-. **praˊptaˢ**, obtained, placed, fixed, proper, right. Cfr. *probo*,

Prone. **praṇaˢ**, old; **praṇataˢ**, bending, stooping; **pravaṇaˢ**, bent.

Propinq-. v. Pro-, -Pinge. [Cfr. *pronus*.

Prose, Pross. **bruˊ**, to speak or tell.

PROUD. **praudhaˢ**, impudent, arrogant. v. Pride.

Prove. v. Prob-. [v. Pro-.

Prow. **pru**, to go, to move. Cfr. *prora*; it. *prua, proda*; sp. *proa*.

Prox-. v. Prick.

Prude-, Prudent. **vṛt, vṛdh**, to select, to speak, to shine. Cfr. *φραδή*; *prudens*; goth. *frod*; g. *spröde*; d. *vroed, preutsch*; fr. *prude*. v. Pride.

Pter-, Ptos-, Ptote. **pat**, to move, to fall. Cfr. *πτερόν, πτώσις*.

Publ-. v. People.

Pucker. v. Bag.

Pudder. v. Bother.

Pud-. (re-.) **pud**, to leave, to quit. [fr. *boudin;* w. *poten.*

Pud-dle. **pad**, to heap together, to accumulate. Cfr. g. d. *pudding;*

Puerile. **puttraˢ**, a son, a child; **potaˢ**, the young of any animal. Cfr. *πάις, πῶλος; puer, pupa, putus.*

Puff. **pavaˢ**, air, wind. Cfr. pers. d. *pof;* g. dan. *puff.*

Pug. v. Pig.

Pugil, Pugn-. **pacʃ**, to take or accept, to take a part or side. Cfr. *πύξ, πυγμή; pugil, pugna, pugnus;* g. *faust.* v. Fist.

Puiss-. v. Pot-.

Pul-. v. Pile.

Pullet. v. Filial.

Punch, Punct-, Pung-. v. Point.

Punish. v. Pain.

Pundit. **paṇditaˢ**, a learned man.

Pur-. v. Pair, For. [fr. w. *pur.*

Pure. **paraˢ**, best; **puˊ**, to purify. Cfr. *purus;* it. sp. *puro;* ags.

Purse. **pṛ**, to fill; **bhṛ**, to carry; **vṛ**, to cover. Cfr. *βύρσα; byrsa;* it. *borsa;* fr. *bourse.* [*puteo;* goth. *fuls.*

Puru-, Pus. **puˊya**,, pus; **puˊy**, to stink. Cfr. *πύθω, πύον; pus,*

Push. **paʃ**, to move, to oppose, to touch. Cfr. d. *puis;* fr. *pousser.*

Put. **puṭ**, to fasten, to bind together; **paṭ**, to portion, to distribute, to encompass. Cfr. *puto;* fr. *bouter;* d. *poot-en.* v. Pace, Pos-.

Put-. v. Puru-.

Pyl-. v. Pile.

Pyr-. v. Fire.

Pyth-. **budh**, to know, to understand.

Pyx-. v. Box. [*quar-.*

Quadr-, Quar-. **tʃatur**, four. Cfr. *τέτταρες, τέτρα-; quatuor, quadr-,*

Quail, Quake. **cvel, tʃal, hval**, to shake; **chadʒ**, to churn or agitate. Cfr. it. *quagliare;* sp. *cuajar;* fr. *cailler;* ags. *cwellan, cwalian.* [what. v. Quot.

Qual-, Quant-. **cva**, where; **caˊṇdaˢ**, a quantity; **caˢ, caˊ, ci**,, who,

Quarrel. **cur**, to sound; **ghur**, to be terrible, to inquire, to sound. Cfr. *queror;* g. d. *kirren;* it. *querela;* fr. *querelle.*

Quarry. **chur**, to cut, to scratch.

Quash. **caʃ**, to hurt, to injure. Cfr. *quatior, quass-;* g. *quetschen;* d. *kwetsen;* ags. *cwysan;* it. *squassare;* fr. *casser.* v. Cut.

Quat-. v. Qaadr-. [*huiveren;* sp. *quiebro;* w. *cwibiaw.*

Quaver. **cep**, to shake, to tremble; **vabhr, ɕvabhr**, to go. Cfr. d.

Qucach. v. Quiek. [*ghenâ;* goth. *qvens;* og. os. *quena;* ags. *cvæn.*
Quean, Queen. **dʒani′**, a woman; **cani′**, a girl. Cfr. *γυνή;* zend.
Queek. v. Quail.
-Quedry. (Sur-.) v. Heed.
Queer. **hvr**, to make crooked. Cfr. g. d. *quer, querlen.*
Queme. (ags. *cweman.*) **cam**, to love.
Queneh. **ca′ˌtʃ**, to bind; **cuˌtʃ**, to contract, to be confined.
Quer-. v. Quarrel, Queer. [*question.*
Quest. **dʒuʃ, gaveʃ**, to seek, to investigate. Cfr. *quæstus;* fr. sp.
Quib-. v. Quaver. [*g. quick;* d. *kwik;* ags. *cwic.*
Quiek. **dʒi′v**, to live; **cutʃ**, to go. Cfr. *vigere, vivere;* goth. *quivs;*
Quid-. v. Qual-.
Quill. v. Calamus, Culminate. [*colcha.*
Quilt. **cu′l**, to cover, to screen, to enclose. Cfr. it. *coltre;* sp. pg.
Quiney. v. Cyn-, Aehe.
QUINTAL. v. Hundred.
Quip. v. Quaver.
Quire. **tʃhur**, to eut. v. Chor-, Quer-.
Quirk. v. Queer.
Quis-. v. Quest. [d. *kwijten;* pg. sp. *quitar;* fr. *quitter.* v. Cede.
Quit. **ha′**, (**dʒaha′ti,**) to leave; **vitta**, to leave. Cfr. g. *quittiren;*
Qviver. v. Quaver, Quiek.
Quiz, Quo-. v. Qual-, Quest. [mueh?
QUOT. **catham**, a particle of interrogation; **cati**, how many? how
QUOTE, QUOTH. **cath, chya′**, (**chya′ti,**) **vad**, to relate. Cfr. *κοτέλλω;*
in-quit; goth. *qvithan;* ags. *cvedhan.*
Rab-. **raph, rab, raˌv**, to go, to move; **rabhasaˢ**, speed; **saˌrabdhaˢ**, furious. Cfr. *ῥέπω;* *repente, rabio, rapidus;* it. *rabbia;* sp. *rabiar;* d. *revelen.* v. Rap-.
Race. **rʃ, hreʃ**, to go; **rayaˢ**, speed. Cfr. רוּץ a race; w. *rhed,*
Rack. v. Break. [*rhedu, rhaz, graz;* sw. *resa;* d. *ras.* v. Grad-.
Raey. **ras**, to taste, to relish.
Radiant. v. Ray. [*rado, rodo, radix;* d. *radijs;* ags. *rendan.*
-Rade, Radie-. **rad**, to dig, to tear; **radaˢ**, a tooth. Cfr. *ῥίζα;*
Raff. v. Rab-.
Raft. v. Row.
Rag. v. Break. [v. Rab-.
Rage. (rabjes.) **rudʒ**, to afflict, to disorder; **ra′gaˢ**, mental affection.
Raid. **radh**, to injure or kill. v. Ride.
Rail. **ragh**, to be right or correct. Cfr. *regula;* g. *riege, riegel.*
Raiment. v. Ray.

Rain. **ritʃ**, to scatter, to divide; **radʒas**, dust; **vrʃ**, to sprinkle. Cfr. *βρέχω*; *rigo*; goth. *rign*; g. d. *regen*; ags. *hregnan*.

Raip. v. Rep-.

Raisin. **ras**, to taste, to relish; **rasas**, juice, exudation; **rasa′**, the grape. Cfr. g. *rosine*; dan. *rosin*; fr. *raisin*. v. Red.

RAJAH. v. Reg-.

Rake. **rdʒ**, to acquire. Cfr. ags. *racan*, *raeian*; g. *reehen*; fr. [*raeler*. v. Break.

Ram-. **ra‸ph**, to go, to move, to injure or kill; **ram**, to sport or play.

Rane. v. Run.

Range, Rank. **ra‸ch**, to go, to move; **ratʃ**, to arrange. Cfr. it. *rango*; fr. *ranger*.

Rant. **ran**, to sound; **rat**, to speak; **rud**, to weep. Cfr. רוּר to mourn, רנן to shout; *rana*; w. *rhonta*.

Rap-. **ri′v**, to take. Cfr. *ἁρπάζειν*; *rapere*; goth. *bi-raubon*; g. *berauben*; ags. *reafian*; sp. *robar*. v. Rab-.

Rase. v. -Rade.

Rash. **rʃ**, to go; **ruʃ**, anger, passion. Cfr. g. d. *rasch*; sw. dan. [*rask*. v. Grad-.

Rat. (ags. *ræt*; g. *ratze*; d. fr. *rat*; sp. pg. *rato*.) v. -Rade.

Ratch. v. Break.

Rat-, Rate, Rath-. **r**, **rt**, **hru′d**, **ard**, to go; **rat**, to speak; **ra′dh**, to effect, to accomplish. Cfr. *ῥέω*, *ῥήτωρ*; *ratus*, *ratio*; ags. *rædan*, *hrathe*, *hrad*; goth. *rodjan*, *raths*, *raidjan*; g. *reiten*, *bereit*, *reden*; d. *reeden*, *reden*, *bereid*; it. *ragione*, *razionale*; fr. *raison*. v. Ord-.

Rauc-. v. Rough.

Rav-. v. Rap-.

Raven. v. Crow.

Raw. v. Crude, -Rade.

RAY. **ra′dʒ**, to shine; **ra‸dʒ**, **ray**, to go; **rad**, to divide, to split. Cfr. *radius*; it. *raggio*, *radio*; fr. *rayon*; sp. pg. *rayo*.

Raz-. v. Rade.

Re-. **pa-ra′**, back.

Reach. **rdʒ**, to acquire, to go, to stand or be firm; **rdʒus**, upright. Cfr. *ὀρῠγόω*, *ὀρέγω*; *regere*, *rigere*, *frigere*, *rex*, *regio*, *rectus*, *por-rigere*; goth. *raihts*, *rakjan*; g. *reichen*, *reich*, *recht*, *recken*; d. *reiken*, *rekken*; ags. *recan*; it. *recere*.

Read-. v. Rat-.

Reak. v. Reach.

Real. **ra′**, to give; **rais**, wealth, property. Cfr. *res*; it. *reale*; sp. [*real*; fr. *reel*. v. Rat-.

Realm. v. Reg-.

Reap, Reave. v. Rap-, Crop.

Reason, Rede. v. Rat-.

Reck. **rec**, to suspect, or think probable. v. Reach.

Rect-. v. Reach, Reg-.

Red. **rohitaˢ**, ruddy; **ruǥ**, **rutſ**, to shine; **ruˊdhaˢ**, budded, blown; **rudhira**,, blood. Cfr. *ἐρυθρός*, *ῥόδον*, *ῥούσιος*; *roseus, ruber, rufus, rutilus, russus, radius*; goth. *ga-rindjo, rauds*; ags. *reod*,

Reed. v. Rod. [*rude*; g. *roth*; d. *rood*; fr. *rouge*. v. Ray.

Reef, Reeve. **riˊv**, to take, to screen. Cfr. goth. *-raip*; g. *reifen*; d. *reep, rib, rif, reef*; sw. *ref*; dan. *rift, riv*.

Reg-, Reig-. **racſ**, to guard, to protect, to preserve; **raˊdȷaˊ**, a prince. Cfr. *rex, rego, regula*. v. Reach.

Re-hearse. **hraſ**, to speak; **hras**, to sound.

Relish. v. Lick.

Rem-. **ṛ**, **raˌv**, to go; **aritra**,, a rudder. Cfr. *ἐρέτης*, *ἐρετμός*; *ratis, remus*; ags. *ar, rother*; g. *ruder*; sw. *roder*; d. dan. *roer*.

Reminiscence. v. Man.

Rend. v. -Rade.

Repent. **rep**, to go. v. Creep, Serp-, Pain.

Rescue. **scu**, to raise or lift; **aˊ-scu**, to seize, to take. Cfr. it. *riscuotere, riscattare*; sp. *rescatar*; pg. *resgatar*. v. Get, (Re-ex-captare.)

Resin. **ṛ**, to go; **rasaˢ**, juice, exudation. Cfr. *ῥέω*, *ῥητίνη*; *resina*; [fr. *resine*.

Revel. v. Rap-.

Revere. v. Fear.

Rhetoric. **ret**, to speak. v. Rat-.

Rheum, -Rhœa. **ṛ**, to go. Cfr. *ῥέω*, *ῥεῦμα*.

Rhin-. **riˊnaˢ**, oozing, dripping. Cfr. *ῥίν*.

Rhod-. v. Red

Rib. v. Reef

Rich, -Rick. **raˊdȷyaˢ**, a government, a principality; **ṛtha**,, **rictha**,, wealth; **rdȷ**, to acquire, to gain or earn. Cfr. goth. *reiks*; g. *reich*; d. *rijk*; ags. *ric*; sp. *rico*; fr. *riche*. v. Reg-.

Rick-. v. Ridge.

Rid-. v. -Rade. [d. *rijden*; ags. *ridan*. v. Rat-.

Ride. **riˊ**, to go; **rathaˢ**, a carriage. Cfr. *rheda, rota*; g. *reiten*;

Ridge, Right, Rigid. v. Reach.

-Rif. v. Reeve.

Rigation. v. Rain.

Ring. **raˌg**, to go. v. Career, Chord.

Rif-, Rip-, Rive. v. Rap-. [fr. *rite*.

Rite. **riˊtiˊ**, usage, practice, observance. Cfr. *ritus*; it. sp. *rito*;

River. (ar-rive.) **riˊ**, **riv**, to go. Cfr. *ῥέω*; *rivus*; it. *riviera*;

Rix-. v. Reg-. [fr. *riviere*.

Roach. v. Red.
Road. v. Grad-, Ride.
Roam. v. Ram-.
Rob. v. Rap-.
Rock. v. Crag.
Rod. **rudJ**, to hurt or injure, to bend or break. v. Radic-, Ray.
Rodent, Root, -Ros-. v. -Rade, Ray.
Rodo-. v. Read.
Rog-. v Pray.
Roil. v. Broil.
Romp-. v. Ram-, Rup-.
Rook. v. Crow.
Rope. v. Reef.
Roscid. **rasaˢ**, water; **vṛf**, to sprinkle. Cfr. *δρόσος, ἔρση; ros-cidus.*
Rose, Rouge. v. Red.
Rosin. v. Resin.
Rostrum. v. Root.
Rota-. v. Ride. [*rauch, hrug;* d. *ruig.*
Rough. **ru´cf**, to be harsh. Cfr. *raucus, ruga;* ags. *rug;* g. *rauh,*
Round. v. Run.
Roup. **rap**, to speak.
Rout-. v. Rup-, Road, Ride, Root.
Rove. v. Rab-.
Row. v. Rail, Rank, Rem-.
Roy-. v. Reg-.
Rub-, Rud, Ruf-. v. Red.
Ruck, Rug-. v. Rough.
Rudder. v. Rem-.
Rude. **rod**, to disrespect. v. Raw. [d. *rouwen;* ags. *reowian.*
Rue. **ru**, to roar; **rud**, to weep. Cfr. *ὠρύω; rumor, rudo;* g. *reuen;*
Ruin. **sru**, to flow; **ṛ, ra‚v, rev**, to go. Cfr. *ruo, ruina;* sp. it.
Rule. v. Reg-. [*ruina;* fr. *ruine.*
Rumble. **ra‚b**, to sound, to go. Cfr. it. *rombare;* g. *rummeln;*
Ruminating. **romantha„** ruminating. [d. *rommelen.*
Rumor. v. Rue.
Run. **ṛn, ran**, to go; **ara„** swiftly. Cfr. goth. *rinnan;* g. *rennen, rinnen;* d. *rennen;* ags. *rennan.*
Rup-. **lup**, to cut, to rob. Cfr. *rumpo, rup-.* [ags. *reosan.*
Rush. **ṛf**, to go; **ruf**, to be angry. Cfr. g. *rauschen;* d. *ruischen;*
Russet, Rust, Rutil-. v. Red.
Rustle. **ras**, to sound.

Rut. **rata**$_{,,}$ copulation. Cfr. fr. *rut.* v. Ride.

Ruth. v. Rue.

Rye. v. Ray, Rough.

Sabre. **subh**, to hurt or kill.

Saccharo-. v. Sugar.

Sack. **sag**, to cover; **sevaca**^{s}, a sack; **sagh**, to hurt or kill; **satf**, to follow. Cfr. *σάγος, σάκκος; saccus, sequor, sagum.*

Sacro-. **sag**, to coverr Cfr. *sacer;* w. *seg-ru.*

Sad-. **ǥat**, **fad**, **sad**, to be weary or dejected. v. Sed-.

Safe, Sage, (salvja.) v. Sal-.

Sag. v. Swag. [*saggio;* fr. *sage.* v. Seek.

Sage. **su'tf**, to give information, to espy. Cfr. *sagio, sagax;* it.

Sagit-. **srdj**, to quit, to shoot; **srga'**, a short arrow. v. Sack.

Sail. **hval**, **ǥal**, **cfal**, **sva.g**, to move, to shake. Cfr. w. *hwyl;* ags. g. sw. *segel;* dan. *sejl;* d. *zeil.*

Saint. **fan**, to give, to serve or honor; **ǥa'nta**^{s}, meek, purified. Cfr.

Sake. v. Seek. [*sancio, sanctus;* it. sp. *santo;* fr. *saint.*

Sal-. **fal**, **sal**, to go, to move; **sarvas**, all, whole, entire; **sev**, to serve. Cfr. *οὖλε, ʿολοός, ʺολος; salvus, salve, salu-, salio;* ags. w. *sal;* goth. *sels;* g. *selig.* v. Well, Whole.

Saline, Salt. **sara**^{s}, salt. Cfr. *ʺαλς; sal;* it. *sale;* fr. *sel;* goth.

Saliva. **sala**$_{,,}$ water. [sw. dan. ags. *salt;* g. *salz.*

Saloon. v. Cell-.

Salpinx. **ǥu'l**, to make a loud noise.

Same, Sample. **sam**, together; **samas**, like, similar. Cfr. *ʺαμα, ʿομοῖος, ʿομαλός, ʿομός; simul, similis, ex-emplum;* goth. *sama, samath;* g. *sammeln, ziemen;* d. *zaam;* dan. sw. *samme;* ags. *same;* fr. *sembler.* [firm, steady. v. Saint, Sound.

Sane, Sano-. **san**, to give, to serve; **sat**, (**san**,) true, best, venerable,

Sand. **fanda**^{s}, a heap.

Sanies. **ǥan**, to move.

Sanscrit. **sa$_{,}$scrta**^{s}, finished, perfect, completed. [*συνέδριον.*

Sanhedrim. **sam**, together; **dhr**, to hold, to support. Cfr. *ʿεδρά-ζω.*

Sarplier. v. Serp-.

Satchel. v. Sack.

Sate, Satis. v. Sane, Sed-. Cfr. *satis;* goth. *saths;* g. *satt.*

Satrap. **cfetra**$_{,,}$ a field; **pa'**, to protect.

Sauce. (*salsus.*) v. Saline.

Savage. **sa'la**^{s}, a tree. Cfr. *silva;* sp. *salvage;* it. *selvaggio;*

Save. v. Sal-. [fr. *sauvage.*

Saw, Sax-. **sagh**, **ǥaf**, to hurt, to kill; **ǥo**, to whet or sharpen;

ʒa′naˢ, a saw; **fiv, siv**, to sew, to stitch. Cfr. *ζάγαλον*; *seco, suo, saxum, seg-*; g. *saum, sägen*; goth. *siujan*; d. *zaagen*; ags. *seax, seam, siwian*; it. *segare*; fr. *scier*. v. Sched-.

Sawder. **saˌd**, to flatter.

Say. **ʒatʃ**, to say or tell; **suˌtʃ**, to give information. Cfr. goth. *sagan*; ags. *sægan, sacgan*; g. *sagen*; d. *zeggen*; pers. *sachan*.

Scab. **scabh**, to impede; **scu**, to go, to cover. Cfr. *σκάπτω, σκάφη*; *scabies, scabo*; goth. *skaban, skip*; ags. *scæb*; g. *schabe, schiff*;

Scale, Scall, Scallop, Scalp. v. Shell.

Scalene. **schal**, to stumble or fall, to gather, to collect. Cfr. *σκαληνός, σκολιός*; ags. *scul*; g. *schel, schiel*; d. *scheel*.

Scamper. **faˌb, tʃaˌp**, to go, to move. Cfr. d. *schampen*; it. *campare, scampare*; sp. *escampar*; fr. *cscamper*.

Scand-, Scant. **scaˌd**, to go, to leap.

Scape. v. Shaft.

Scare. **ghur**, to be frightful or terrible.

Scar-. **chaˌ′riˌ′**, a scar. v. Shear.

Scat-. **tʃat**, to cut, to rain. Cfr. *σκεδάω*; *scateo, dis-cutio*; ags.

Scathe. **chad, schad, ʒath**, to hurt or kill. Cfr. *ʾασκεθής*; goth. *skathjan*; ags. *scathian*; g. *schaden*; d. *schaaden*.

Scav-. v. Shave.

Scel-. **schalat**, stumbling, (either in action, conduct, or speech.)

-Scend. v. Scand-.

Scent. **gandhaˢ**, scent.

Sceptre. **cʃap**, to send, to throw. Cfr. *σκήπτω, σκῆπτρον*; *sceptum*.

Sched-. **tʃhid, schad**, to cut. Cfr. *σχίζω, σχέδη*; *scindo, scheda, schedula*; goth. *skauts, skaidan*; ags. *sceadan, sceat*; g. d. *scheiden, schot, schoot*; it. *scotto*; sp. *cscotc*; fr. *ccot*.

Schism, Schist. v. Sched-.

School. **cul, cʃal, schal**, to collect; **tʃal**, to sport, to play. Cfr. *σχολή*; *schola*; ags. *sccol, scol*; g. *schule*; d. *school*; it. *scuola*; fr. *ecole*.

Scia-. v. Sky.

-Scind, Sciss-. v. Sched-.

Scint-. v. Candid.

Scollop. v. Shell.

Scob-, Scoop. v. Scab.

Scop-. v. Skep-, Scab.

Scorb-, Score, Scor-. v. Scar-.

Scorch. v. Char.

Scot-. v. Sched-, Shade.

Seour. v. Shear. [it. *scoreggia*; fr. *escourgée.*

Seourge. **cardʒ**, to pain, to harass; **ra′dʒ**, to rule. Cfr. *rego, corrigo;*

Scov-, Seow. v. Scab.

Seowl. v. Scalene.

Seabble. v. Grab.

Seraneh. v. Craunch.

Serap, Serape, Serawl. v. Grab.

Serateh. v. Cratch.

Seream. **ɕra′m**, to eall, to summon. (ags. *hreman.*)

Seribe, Script-, Scriv-, Scrub, Scruple. v. Grab, Carp-.

Scringe. v. Cringe.

Serutiny. **ɕru**, to listen.

Seud, Seug, Seum. **scu**, to go, to eover. Cfr. ags. *seeo, seeog, seeotan;* dan. *skœ, skygger, skyder, skud;* g. *sehuh;* d. *schœn;* sw.

Seull. v. Shell. [*skudda.* v. Shed, Shoot.

Seulp-. **clrptaˢ**, made, formed, eut.

-Seure. (ob-.) v. Shade.

Seurf. v. Shear.

Seut-. v. Eseutehcon.

Scythe. v. Sehed-.

Sea. **sava**, water; **ſatſ**, to moisten, to sprinkle; **ſasdʒ**, to move. Cfr. goth. *saivs;* ags. *sæ, scege, garsege;* g. *see;* d. *zee;* sw. *siö.*

Seal. v. Sigil.

Seam. v. Saw. [Cfr. fr. *chercher;* it. *eercare.*

Search. **sardʒ**, to gain or get; **saɕtſ**, to follow; **tſartſ**, to inquire.

Seeant, Seet-. v. Saw.

Second, Sectator. v. Seek.

Seat, Sed-, See. **sad, fad**, to set, to sit. Cfr. ″εζωμαι; *sedeo, sido, sedo, sella;* goth. *sita, satjan;* g. *setzen, sitzen;* d. *zetten, zitten;* ags. *setan, sitan;* it. *sedare;* fr. *seoir, siége.* v. Sad-, Seek.

Sedge, Seg-. v. Saw.

Seed. v. Sow.

Sec. v. Sight.

-Seech, Seek. **satſ, saɕtſ**, to follow; **su′tſ**, to espy; **sagh**, to strike; **ɕuc, sec**, to go; **sacha′, sachyaˢ**, a friend, an assoeiate. Cfr. *sequor, socius, secutus, secundus;* g. *suchen;* d. *zœken;* ags.

Seem. v. Same. [*secan, sacan;* fr. *suivre.*

Seethe. v. Sweat.

Seignor. v. Senate.

Sembl-. v. Same.

Semi-. **sa′mi**, half. Cfr. ″ημι-συς; *semi.*

Seminal. v. Sow.

Senate, Sen-. **sa,hatiꞅ**, assemblage, multitude; **ſan**, to serve or honor; **sanat**, always. Cfr. *ϝενος*; *senex, senatus;* goth. *sineigs.*

Send. **nud**, to send.

Sense, Sent-. **sat**, to manifest, to point out. Cfr. *sentio, sensus.*

Sept-. **saptan**, seven. Cfr. שבע; *ἑπτά*; *septem;* goth. *sibun;* g. *sieben;* ags. *seofan;* fr. *sept;* it. *sette;* w. *seith.*

Septic. **ɢav**, to alter, to change; **ɢavaꞅ, ɢapaꞅ**, a corpse.

Seq-. v. Seek.

Ser-. **sur**, to shine. Cfr. שרף a seraph, a fiery serpent; *serenus;* [fr. *serein, soir.*

Serf, Series, -Sert. **ɢu´rp**, to mete; **srp, sr, sarb**, to go; **sev**, to to serve; **sarat**, thread. Cfr. *σειρά, εἴρω, εἴρερος*; *sero, series, servus, servio.*

Sermon. **svr**, to sound, to praise, to sing; **ɢra´m**, to counsel, to invite.

Serpent. **srp**, to glide; **sarpaꞅ**, a serpent. Cfr. *ϝερπω*; *serpo, serpens;* w. *sarf.*

Serve. v. Serf.

Serum. **sa´ra,**, water.

Sess-, Set. v. Seat.

Setous. **sataꞅ**, a mane, a crest. Cfr. *seta, setosus;* fr. *seton.*

Seven. v. Sept-.

Sew. v. Saw, Seek, Sicc-.

Sex. . v. Saw, Six.

Shabby. v. Scab.

Shade. **tſhad**, to cover, to hide; **scu**, to cover. Cfr. *σκιά; obseurus;* goth. *skadus;* ags. *scad, scuva, sced;* g. *schatten, schützen;* d. *schaduw, schutten.*

Shaft. **cſap**, to send, to throw. Cfr. *scapus;* ags. *sceaft;* g. d. *schaft;* dan. sw. *skaft.*

Shag. **tſhagaꞅ**, a goat; **ſag**, to cover.

Shake. **ſec**, to move.

Shale. v. Shell.

Shallop. **tſal, ɢal**, to move, to tremble, to shake. Cfr. sp. pg. *chalupa;* fr. *chaloupe;* g. *schaluppe.*

Shamble. v. Scamper, Scand-.

Shame. **ſam**, to be confused, to distress.

Shard, Share, Sharp. v. Shear, Carve.

Shatter. **cſad**, to break; **cſataꞅ**, broken, torn, rent. v. Scathe.

Shave. v. Scab, Champ.

Shaw. v. Shade.

She. **sa´**, she. Cfr. *se;* goth. *si;* ags. *seo;* g. *sie;* d. *zij.*

Sheading. v. Sched-.

Sheaf. ſi, to tie, to bind; ſiv, to sew, to stitch.

Shear. cſur, tſhur, to cut; hr, to take. Cfr. *σχωρία, ξυράω*; ags. *scearan*; g. *scheren*; d. *scheeren*.

Sheath, Shed. scad, to shed, to pour out. v. Shade, Suade, Sched-.

Sheen. v. Shine.

Sheet. v. Sched-.

Shell. ɢalcas, a portion, bark, a fish-scale; tſhalli′, skin, bark, rind, &c.; tſalis, a cover. Cfr. ags. *scalc, scell*; g. *schale*; d. *schaal*.

Shelter. v. Ceil, Shield.

Sherd, Sherif. v. Shard.

Shield. ɢalitas, covered. v. Escutcheon.

Shilf. (g. *schilf*.) ɢil, to glean.

Shimmer. ſimbh, to shine.

Shine. can, ſi‚bh, tſa‚d, to shine. Cfr. goth. *skauns*; ags. *scinan*; g. *scheinen, schön*. v. Cand-.

Ship. v. Scab, Shaft.

Shire. v. Shard.

Shirt. v. Curt.

Shive. v. Champ.

Shoal. v. School.

Shock. v. Shag.

Shoe. v. Scud.

Shoot. cſot, to throw; cſatnas, a man of the second, or military class. Cfr. *scateo*; ags. *sceotan, scytan*; g. *schicssen, schossen*; d. *schicten*; fr. *jeter*. v. Shatter.

Shop. cſapas, a house, an abode. (ags. *scoppa*.)

Short. v. Curt.

Shoulder. (ags. *sculder*.) scandhas, the shoulder.

Shout. ſa′t, an interjection of calling.

Shove. v. Champ.

Show. v. Skep-.

Shower. a′sa′ras, a hard shower; cſaras, water, trickling.

Shr-. v. Scream.

Shred. v. Curt, Shear.

Shrieve. v. Shire, Reeve.

Shrine. ɢran, to give, to present; scu, to cover.

Shrink. ɢra‚c, cru‚tſ, to go. v. Cringe.

Shroud. (ags. *scrud*.) ɢrath, to bind, to tie.

Shrug. v. Reach.

Shuffle. v. Shove.

Shudder. ſad, to wither, to despond, to break; sadaras, fearful. [v. Dire.

Shun, Shy. (ags. *scunian.*) **ɕunyaˢ**, empty, void; **ɕyai**, to go. v. Scud. [*seche.*

Siccity. **ɕuʃ**, to dry; **ɕuʃcaˢ**, dry; **sicataˊˢ**, sand. Cfr. *siccus;* fr.

Sick. v. Sigh.

Sickle. v. Saw.

Side, Siege. v. Seat, Seek.

Siesta. **ʃas, ʃasti**, to sleep.

Sigh. **ɕutʃ**, sorrow, distress; **ɕutʃy**, to squeeze out, to pain or distress. Cfr. ags. *sican;* goth. *swogjan;* d. *zuchten.*

Sight. **suˊtʃ**, to espy; **suˊtʃaˊ**, sight. Cfr. ags. *gesiht;* g. *siehen, gesicht;* d. *gezigt;* dan. *sigt.* v. Seek.

Sigil-, Sign. **suˊtʃ, diɕ**, to make known; **sadjnaˊ**, gesture, signal. Cfr. *δεικνύμι; signum, sigillum;* goth. *sigljan, taikns;* ags. *sigel, tacen;* g. *siegel, zeichen;* d. *zegel, teeken;* it. *sigillo,*

Sike. v. Siccity. [*segno;* dan. *segl, tegn;* fr. *sceau, signe.*

Silence. **ɕiˊl**, to meditate, to reflect profoundly and abstractedly. Cfr. *sileo;* goth. *ana-silan;* fr. *silence.*

Silex, Sill. **ɕilaˊ**, a stone, a rock, the timber of a door-frame, a transverse beam. Cfr. *calx, silex;* ags. *syl;* g. *schwelle;* fr.

Silvan. v. Savage. [*seuil.*

Sim-. v. Same. [*siggvan;* g. *singen;* d. *zingen;* ags. *singan.*

Sing. **ɕi˛dj**, to make an inarticulate sound, to tinkle. Cfr. goth.

Sink. **sa˛cuˢ**, a hole.

Sire, Sirius. **sur**, to shine, to possess supreme power; **suˊryaˢ**, the sun. Cfr. fr. *sire, sieur.* [ags. *sweoster.*

Sister. **svasr̥**, a sister. Cfr. goth. *svistar;* g. *schwester;* d. *zuster;*

Sit. v. Sed-. [*zes;* sp. *seis.*

Six. **ʃaʃ**, six. Cfr. *ϝϝ* six; *ϝεξ; sex;* goth. *saihs;* g. *sechs;* d.

Size. v. Sched-, Sed-.

Skaddle. v. Scathe.

Skald. v. Call.

Skar. v. Scare.

Skate. v. Scud.

Skeel. v. Shell. [ags. *sceawian.*

Skep-. **spaɕ**, to perceive, to inform. Cfr. *σκέπ-; specio, speculum;*

Skew. v. Askant.

Skiff. v. Scab.

Skill. **ɕiˊl**, to learn; **ɕiˊlitaˢ**, skilled.

Skillet. v. Shell.

Skim, Skin. v. Scud, Sched-.

Skipper. v. Ship, Slip.

Skirt. v. Short.
Skittish. **cit**, to fear, to terrify.
Skivers. v. Shave.
Skulk. v. Shelter.
Skull. v. Shell.
Skute. v. Scow.
Sky. v. Shade.
Slabber. v. Lab-, Saliva.
Slash. v. Lash. [*schlottern ;* fr. *éclater ;* sw. *slita.*
Slat-. **ɠlathaˢ**, loose, dishevelled, relaxed, unfastened. Cfr. g.
Slaver. v. Slabber.
Sleep. **srp**, to creep ; **svap**, to sleep ; **svapnaˢ**, sleep, dream. Cfr. *ὕπνος ; sopor, supinus, somnium ;* goth. ags. *slepan ;* g. *schlafen ;* d. *slaapen ;* on. *sofa.*
Sleek, Slick, Slight. v. Light. [v. Lab-.
Slip. **srp**, to creep. Cfr. ags. *slepan ;* g. *schlüpfen ;* d. *sleppen.*
Sloop. v. Shallop.
Sloth, Slottery, Slut. v. Slat-.
Slouch, Slow, Slug-. v. Lag.
Small. v. Meal.
Smaragd. v. Emerald.
Smack, Smash. v. Mash.
Smerk, Smicker, Smile. **smṛ**, to remember, to delight ; **smaraˢ**, the deity of love ; **smi**, to smile ; **smiˊl**, to wink.
Smoke. v. Mic-turition.
Snail, Snake, Sneak. **naˊgaˢ**, a snake ; **snigdhaˢ**, smooth, greasy, cooling. Cfr. g. *schnake, schnecke ;* ags. *snegel, snaca ;* dan.
Sneeze. **ʃnas**, to eject from the mouth. v. Neese. [*snegel, snog.*
Snick. v. Nick.
Snivel. **ʃnu**, to ooze, to drop.
Snore, Snort. **nard**, to sound.
Snow. **niˌv**, to moisten, to sprinkle ; **ʃnu**, to ooze, to drop. Cfr. *νίφα ; ningere, nivis, nix ;* lit. *snegas ;* slav. *snegu ;* goth. *snaivs ;* g. *schnee ;* d. *sneuw ;* ags. *snaw ;* fr. *neige ;* pg. it. *neve.*
Snudge, Snug v. Near. [g. *so ;* d. *zo.*
So. **svaˢ**, individuality, affirmative quantity. Cfr. goth. ags. *sva ;*
Soak. **ʃatʃ, ʃitʃ**, to wet, to sprinkle. Cfr. שקה to irrigate ; ags. *socian.*
Soar. **sṛ**, to go, to run.
Soc-. v. Seek.
Sock-. **sag**, to cover ; **sadʒdʒaˢ**, covered, clothed ; **sactiˢ**, junction,

cohesion. Cfr. *soccus;* ags. *socc;* g. *socke;* d. *zok;* it. *socco;* fr. *socque.* v., Sack.

Sod. **ɕa´d**, young grass, mud. v. Sed-, Seethe.

Soda. v. Cathartic.

Sofa. v. Sleep.

Soggy. v. Soak.

Soiree. **ʃo**, to end; **sa´yaˢ**, evening.

Solar. **su´raˢ**, **hailiˢ**, the sun; prakr. **su´la.** Cfr. *ʼηλιος; sol.*

Solute, Solve. **lu´**, to cut. Cfr. *λύω; solvo;* goth. *laus;* g. *los.*

Some. **sam**, assemblage, collection.

Somni-. **ɕam**, to pacify, to calm; **ɕamani´**, night. v. Sleep. [*zoon.*

Son. **su´nuˢ**, a son. Cfr. goth. *sunus;* ags. *sunu;* g. *sohn;* d.

Son-, Song. v. Sound, Sing.

Sooth. **sat, satyaˢ**, true. Cfr. *ʼετεος;* ags. *soth;* ir. *seadh.* v. Sed-.

Soothe. v. Sed-, Snade.

Sop. v. Soup.

Sopite, Sopor-. v. Sleep.

Sore, Sorrow. **ɕaraˢ**, injury, hurt; **ɕṛ, su´r**, to hurt; **sarogaˢ**, sick; **svṛ**, to be diseased, to pain or torture. Cfr. שרח sad, sorrowful; goth. *sair, saurya;* g. *schwer, sehr, sorge;* d. *zeer,*

Sorgho. v. Sugar. [*zwaar, zweer, zorg;* ags. *sar, swar, sory.*

Soss. v. Sed-.

Sot. **ɕathaˢ**, a blockhead, a fool.

Sound. **sa.-nad, ɕabd, svan**, to sound; **ɕundh**, to cleanse, to purify. Cfr. *sonus, sanus;* ags. fr. sp. *son;* it. *suono;* g. *gesund.*

Soup. **su´paˢ**, sauce, soup.

Sour. **tʃu´r**, to burn.

Souter. v. Suture.

South. v. Sweat.

Sover-. v. Super-.

Sow. **su´cari´**, a sow; **ʃu´**, to bring forth. Cfr. *σῦς, ὗς; sus;* goth. *svein;* g. *sau, schwein;* d. *zeug;* ags. *suga.* [ags. *savan.*

Sow. **ʃiv**, to sow. Cfr. *semen, sevi;* goth. *saian;* g. *säen;* d. *zaajen;*

Space, Spade. **pat, pad, spa.d**, to go, to move; **sphaṭ**, to open, to break; **paʼṭaˢ**, breadth. Cfr. *pateo, spatula, spatium;* g. *spaten, spatzieren;* it. *spazio;* fr. *espace;* d. *spaade.* [w. *pange.*

Spangle, Spank. **bha.dʒ**, to shine, to break, to destroy. Cfr. *φεγγω;*

Spar. **spardh**, to rival, to envy.

Sparg-, Sparse. **prdʒ**, to scatter; **sprɕ**, to bathe.

Spatiate, Spatula. v. Space.

Spatter. v. Spit. [Cfr. *specio, species, speculor;* ags. *specan.*

Speak, Spec-. **spaç**, to inform, to make evident; **spaçaꜱ**, a spy.

Speed. v. Pace, Spaee.

Sper-. v. Spir-, Sparg-.

Spet, Spew. v. Spit.

Sphere. **spha´y**, to become large or bulky; **spha´raꜱ**, large; **sphur**, to swell; **svar**, heaven. Cfr. *σφαῖρα; sphæra;* it. *sfera;* fr. [*sphere.*

Spie-, Spike. v. Peak, Speak.

Spider. v. Speed?

Spile, Spill. v. Pile. [*spiritus.*

Spir-. **spṛ**, to live, to breathe; **sprh**, to desire. Cfr. *spero, spiro,*

Spit. **ſti´v**, to spit. Cfr. *πτύω; spuo, sputum;* goth. *speiva;* g. [*sputzen;* ags. *spittan.*

Splaneh-. v. Spleen.

Splash. **pluſ**, to sprinkle.

Splay. **spha´y**, to become large or bulky.

Spleen. **plihan**, the spleen. Cfr. *σπλήν, σπλάγχνον; lien, splen.*

Split. **sphaṭ**, to break or divide.

Spoil, Spool. **pu´l, sphul**, to collect, to heap up.

Spoon. **pu´ṇ**, to collect.

Sport. **spṛ**, to please, to gratify.

Spot, Spout. v. Spit.

Sprawl, Spray, Sprig. v. Ray.

Spread. **sphur**, to swell. v. Broad.

Spring, Spry. **sprh**, to desire, to long for.

Sprinkle. v. Sparg-.

Spud. v. Spade.

Spy. v. Spec-.

Squadron, Square. v. Quadr-.

Squalid. **ca´laꜱ**, black. Cfr. *κελαινός; squalidus;* slav. *kalu;* w. *qual.*

Squall, Squeal. v. Yell.

Squash, Squeeze. v. Squash.

Squill. v. Shell.

Squint. v. Askant.

Squirt. **gṛ**, to sprinkle.

St-. **ſtha´**, to stand.

Stab-, Stack, Stad-, Staff, State. **stabdhaꜱ**, hard, stiff, rigid; **stambhaꜱ**, a post, a pillar, a stack; **ſtha´**, to stand, to stop, to stay. Cfr. *στάσις, στίβος, στάδιον; stips, stipula, stabilis, stasis, statua, stamen, status;* goth. *stabs, staths, standan, stains;* g. *stab;* ags. *staf.*

Stag-, Stair. **ſtag**, to cover; **stigh**, to ascend. Cfr. *στίχος; vestigium;* goth. *steiga, staiga;* g. d. *steigen;* dan. *stiger;* ir. [*staighre.*

Stake. v. Stig-.

Stal-. **sthal**, to stand, to be firm; **sthala**$_{,,}$ a tent, a hillock. Cfr. *στέλλω, στέλεχος;* g. *stellen, stall, stiel;* d. *stal, steel;* ags. *stæl, stælg.*

Stamen. **stha´man**, strength, power; **stheman**, fixedness, firmness.

Stammer. **ſtam**, to be confused.

Stanch. **ta.tſ**, to go, to shrink or contract.

Star. **ta´ras**, a star, the pupil of the eye; **str̥**, to strew, to spread on or over; **a´ſtra**$_{,,}$ the sky. Cfr. *ἀστήρ; astrum, stella;* goth. [*stairno;* g. *stern;* ags. *steorra.*

Stas-, Stat-, Stead. v. Stab-.

-Staur-. **stha´varas**, stable. Cfr. *σταυρός; in-, re-stauro.*

Steal. **sten**, to steal; **steya**$_{,,}$ theft. Cfr. g. *stehlen;* d. *steelen;* ags. *stelan.* v. Toll-. [ags. *steam.*

Steam. **ſti´m**, to be wet or moist, to reek, to steam. Cfr. d. *stoom;*

Steep. **stu´p**, to heap, to pile.

Steer. **sthiras**, firm, steady, a bull; **sthaura**$_{,,}$ strength, power; **sthaurin**, a pack-horse; ved. **sthu´ras**, a bull. Cfr. תור an ox; *ταῦρος; taurus;* goth. *stiur;* d. *stier;* ags. *steor, styrc, steoran.*

Steg-. **sthag**, to cover. Cfr. *στέγω, στεγανός.* [v. Star.

Stell-. v. Star.

Stem. **stambhas**, a post, a stalk, a stem; **stambh**, to stop, to hinder, Cfr. *στέμφυλον, ἀστεμφής; stemma;* g. *stamm;* d. sw. *stam;* ags. *stem.* [*στενός; tenuis.*

Steno-, Stent. **tu´n**, to contract; **tanus**, small, thin, minute. Cfr.

Ster-. **str̥**, to strew, to spread on or over; **sthiras**, firm, steady. Cfr. *στερεός, στερῥός; stercus, sterilis, strata;* goth. *stairo.*

Stick. **stac**, to resist. v. Stig-.

Stiff. v. Stab. [*etouffer;* g. *stopfen;* d. *stoppen.*

Stifle. **sta.bh, stubh**, to stop, to hinder. Cfr. *τύφω; tupa;* fr.

Stig-. **tig**, to assail; **tidʒ**, to endure, to sharpen. Cfr. *στίζω, στίγμα; -stinguo, -stigare, stimulus;* goth. *stiggs, stiks, staks.* v. Stick.

Stil-. **til**, to be greasy, to anoint.

Stile. (ags. *stigel.*) v. Stair.

Stilt. **sthal**, to stand, to be firm.

Stim-, -Stinct, (in-,) Sting. v. Stig-.

Stint. v. Steno-. [*stipes, stipare, stipulari.*

Stip-. **stha´payat**, fixing, placing; **stu´pas**, a heap. Cfr. *στύπος;*

Stir-. v. Ster-, Stair.

Stive. v. Stifle.

Stoak, Stoceade, Stock. v. Stick.
Stolid. v. Stult-.
Stomach. v. Maw.
Stone. **stha´nuˢ**, firm, steady.
STOOL. **sthal**, to stand. Cfr. goth. *stols*; g. *stuhl*; ags. *stol*.
Stoop, Stop. v. Stifle.
Str-, Strab-, Strad-, Strag-, Strahl-, Street, &c. v. Ster-.
STRAIGHT. v. Reet-.
Strike. **strh**, to hurt, to kill.
Stub-, Stuff, Stumble, Stup-. v. Stifle, Stip-.
Stult-. **sthu´laˢ**, stupid, ignorant. Cfr. *stolidus, stultus*.
Stun. **stan**, to thunder. v. Astonish.
Stunt. v. Steno-.
Sturk. v. Steer.
Sty. (ags. *stige, stigan*.) v. Stag-.
Style. v. Stool.
Styptic. v. Stop.
Su-, (-perb.) **su**, well. Cfr. ἐῦ.
SUADE, Suage, Suas-, Snav-. **svad, sva´d, ʃvad**, to be sweet or agreeable, to taste, to cover; **vad**, to speak. Cfr. נית to entice; ἡδύς; *suavis, suadeo*; goth. *sutis*; ags. *svete*; g. *süss*; d. *zœt*.
Suanee. v. Seek.
SUB-. v. Hyp-.
Succulent, Suck. **tʃu´ʃ**, to drink, to suck. Cfr. *sugo, succus*; g. *saugen*; d. *zuigen*; ags. *sucan*; fr. *sucer*.
Such. **su´tʃ**, to give information.
SUD-. v. Sweat.
Suds. v. Soda, Sweat.
Sudden. (*subito*.) v. Sub-, -It.
SUE, Suite. v. Seek.
Sug-. v. Suck.
Sugar. **ɕarccara´**, clayed or candied sugar; **icʃuvica´raˢ**, sugar; **icʃuˢ**, the sugar cane. Cfr. σαχχαρον; *saccharum*; g. *zucker*; [d. *suiker*; it. *zucchero*; fr. *sucre*.
Sulphur. **ɕulva´riˢ**, sulphur.
Sultry. v. Solar.
Sum, -Sume. v. Con-, Same.
Summer. **sumbh**, to shine, to be beautiful. [*sonne*; d. *zon*.
SUN. **su´nuˢ, syu´naˢ, syonaˢ**, the sun. Cfr. goth. ags. *sunna*; g.
SUNDER, Sundry. **ɕu,d**, to break; **sa´ndraˢ**, abundant, clustering;

dṛ′, to divide, to tear. Cfr. goth. *sundro;* ags. *sundrian;* g. SUPER-, Supra-, Sur-. v. Over. [*sondern.*

Supine. v. Sleep.

Supper. v. Soup.

SURE. **ɕu′r**, to be firm or immovable.

Surf. **sṛp**, to go, to move; **ʃṛbh**, to strike, to kill.

Surge. **sṛdʒ**, to leave, to quit.

Surly. v. Sour.

SUTURE. **ʃiv**, to sew; **syu′taˢ**, sewn; **su′traₙ**, a thread. Cfr. *ʒασσύω; suo, sut-;* goth. *siuja.*

SWAG, Sway. **svaᵢg**, to go, to move. v. Vag-.

Swallow. **ɕval**, to go quickly. Cfr. g. *schwalbe;* d. *zwaluw;* ags. *swalewe.* v. Gul-.

Swear. **svar**, to reprove, to sound. Cfr. *assevero;* goth. *swaran;* g. *schwören;* d. *zweren;* ags. *swerian, answaran.*

SWEAT. **ʃvid**, to sweat; **svedaˢ**, sweat, steam. Cfr. *ἱδοτ; sudor;* g. *schweiss;* d. *zweet;* ags. *swat.*

SWEET. **sva′duˢ**, sweet, agreeable. v. Suade.

Swell, Swim. **ɕvi**, to move, to go, to grow, to increase; **ɕval**, to run. Cfr. goth. *uf-svalleins;* g. *schwellen;* d. *zwellen;* ags. *swellan.*

Swelter. v. Solar. [

Swing, Swinge. **ɕvaᵢg**, to go or move. Cfr. g. *schwingen;* d. *zwingelen;* ags. *swingan.*

Swink, Switch. **ɕvaᵢc, ɕvatʃ**, to go, to move.

SYLVAN. v. Savage.

Synagogue. **sama′yogaˢ**, assemblage.

SYRINGA. v. Orange. [tagious. v. Attach.

TACH, TACK, Tact, Tag, Take. **taᵢc**, to bind, to tie; **tva′tʃaˢ**, con-

Tacit. **tu′ʃni′m**, silently. Cfr. *taceo, tacitus.*

Tail. v. Tel-.

-Tail. (de-, en-, re-.) v. Deal.

Talc. v. Tallow.

Tale. v. Toll.

-TALIATE. (re-.) **tula′**, resemblance; **tulyaˢ**, like.

Talk. **tarc**, to speak, to discuss.

Tall. **tal**, to be full or complete, to fix or establish. [d. *talk.*

TALLOW. **til**, to be greasy, to anoint. Cfr. g. sw. *talg;* dan. *talge;*

Tally. **dhuliˢ**, a number. v. Deal.

TALON. **talaₙ**, the sole of the foot. Cfr. *talus;* fr. sp. *talon.*

TAME. v. Dam.

Tang. v. Stig-, Tach.

Tank. **ta‚c**, to bind, to tie; **ta‚cas**, a cleft, a chasm. [ags. *thæt.*

Tanta-. **tat**, that, therefore. Cfr. goth. *thata*; g. *das*; d. *dat*;

Tap. **tu‚p**, to strike, to hurt or kill. Cfr. *τύπος*, *τύπτω*.

Taper, -Taph. **di´p**, to shine, to blaze; **tap**, to burn. Cfr. *τάφος*, *τέφρα*; it. *doppiere*; w. *tampyr*; ags. *taper*.

Tar. **tr´**, to pass over or across; to float or swim.

Tare, Tariff. **dr´**, to tear, to divide. Cfr. *τείρω*, *δέρω*; *tero*; g.

Tassel. **ta‚s**, to adorn, to dress. [*zehren*; d. *teeren*; dan. *tærer.*

Taste. **tʃaʃ**, to eat; **da‚ʒ**, to bite.

Tatter. **tud**, to tear, to pull to pieces.

Tattle. **tut**, to dispute.

Tattoo. **tat**, **tad**, **ta‚d**, to beat, to strike.

Taur-. v. Steer.

Tauto-. v. Auto-, Tanta-.

Teach. v. Doe-.

Tead. (*tæda.*) **tad**, to shine.

Tear. **tuga´**, bamboo manna; **tuh**, to give pain; **duh**, to milk, to give pain; **daʒ**, to bite or sting; **aʒru**, a tear. Cfr. *δάκρυ*;

Tear. v. Tare. [*lacryma*; goth. *tagr*; w. *daigyr.*

Teat. **dhe**, to drink; **duh**, to milk. Cfr. דר the breast, a teat; *τίτθος*; goth. *daddja*; g. *zitze*; d. *tet*; it. *tetta*; sp. pg. *teta.*

Technie, Teet-onie. **tacʃ**, to pare, to make. Cfr. *τέχνη*; *tex-tura*;

-Tect, Teg-. (de-, pro-.) v. Deek. [fr. *tissue.*

Teens. v. Dee-. [*ter-minus.*

Tel-. **tal**, to be full or complete, to found. Cfr. *τέλος*, *τελευτή*;

Tell. v. Talk.

Tem-. v. Tim-.

Temp-. **tamb**, to go or move.

Tempt, Ten-, Tend. **tan**, to expand, to extend, to diffuse; **tanus**, minute, thin; **tantis**, expansion. Cfr. *τείνω*, *τεταν*ός, *τένων*; *tendo, tenco, tenuis, tento, tenax, tener*; goth. *thanja*; fr. *tenter*;

Ten. v. Dec-. [g. *dünn*; d. *dun.*

Tenebrous. **tama‚**, darkness, gloom. [Tophet; *τέφρα*; *tepeo.*

Tepid. **tap**, to heat or be hot; **tapta-cumbhas**, a hell. Cfr. תפה

Teratology. **taras**, passing over or beyond.

Ter-, Term. **tr´**, to pass over, to overcome; **dr**, to hurt or kill; **dr´**, to tear, to rend; **ti´r**, to finish or complete; **tarman**, the top of a sacrificial post. Cfr. *τείρω*, *τρίζω*, *τερέω*, *τορός*, *τέρθρον*; *termo, terminus, trans, tero, teres, terebra, tribula*; goth. *thairh*; og. *durh*; g. *treten, durch*; d. *door*; ags. *thurh.* v. Three.

Terrace. **ti´ra„**, a shore or bank; **dara´**, a cave, a valley.

Terror, -Ter (de-.) **tras**, to fear, to frighten. Cfr. *τρέω*, *ταράσσω*; *terreo*. v. Dire.

Tess-. **tas**, to throw, to toss. Cfr. *πέσσος*; *tessela*.

Test. **da‚ç**, to bite, to see; **drç**, to see.

Tetanus. v. Tempt.

Tetter. **dadruˢ**, tetter; **ta‚tr**, to spread, to extend or expand.

Text. v. Technic.

That. v. Tanta-, The.

Thatch. v. Deck.

Thaw. v. Dew.

The. **saˢ**, **sa´**, **tad**, he, she, it; **tat**, that. Cfr. *ὁ*, *ἡ*, *τό*; *is*, *ea*, *id*; goth. *sa*, *so*; ags. *sa*, *seo*; g. *der*, *die*, *das*.

Theatre, Theory. **dhyai**, to meditate; **ni-dhyai**, to look. Cfr. *θεάομαι*, *θέατρον*, *θεωρία*; *theatrum*, *theoria*.

Thee. **te**, with or by thee.

Theo-. v. Divine.

-Theca, Theme, Thesis, Thetic, Thew. **dha´**, to place; **dha´tuˢ**, a [radical. Cfr. *τίθημι*, *θέμα*, *θέσις*.

There. **dhr**, to place.

Therm-. v. Warm.

Thin. v. Ten-.

Think. v. Thought.

Thir-. v. Three.

Thirl. v. Ter-.

Thirst. **trſ**, to thirst. Cfr. *τέρσομαι*; *torreo*; goth. *thaursja*; g. [*dürr*, *dürste*; d. *dorst*; ags. *thyrst*.

This. **diç**, to exhibit, to explain. Cfr. g. *diese*; d. *deeze*. v. The.

Thole. **dal**, to pierce, to cut; **dala„**, a sheath; **dul**, to excite, to raise. Cfr. *tollo*; goth. *thulan*; g. d. *dulden*; ags. *thol*, *tholian*.

Thomas. **dva´**, two. Cfr. תּם a twin; *δίδυμος*.

Thong. **ta‚c**, to bind, to tie.

Thorn, Thorough. **tarunachaˢ**, **drunachaˢ**, a thorn. v. Ter-, Tree.

Thorp. v. Tribe.

Thou. **tva„**, thou. Cfr. *σύ*, *τύ*, *τᾶν*; *tu*; goth. *thu*; g. dan. sw. [*du*; fr. it. sp. pg. russ. *tu*; ags. *thu*.

Thought. **dhyai**, to think; **dhya´taˢ**, thought.

Thousand. **sahasra„**, a thousand. Cfr. goth. *thusundi*; g. *tausend*; d. *duizend*; sw. *tusend*; ags. *thusend*. v. Ten, Hundred.

Thr-. v. Ter-.

Thrash, Thresh. **dhrſ**, to overcome, to hurt or kill. Cfr. goth. *thriskan*; g. *dreschen*; d. *dorschen*; ags. *therscan*.

Thrave. v. Drift.

THREE. **tri**ˢ, **traya**ˢ, three. Cfr. τρί-, τρεῖς; *tri-, ter, tres;* goth. *thri, threis;* g. *drei;* d. *drie;* sw. dan. it. *tre;* ags. *thri, thrig,*

Thren-. (θρῆνος.) **dhran**, to sound. [*threo;* fr. *trois.*

Thread, Thrid, Through. v. Ter-.

Throw, Thrust. **dhra'd**, to cut or pierce; **trad**, to act, to endeavor; **dhras**, to throw. Cfr. תרך to east out; *trudo;* ags. *thrawan;*

THUMP. v. Tap. [g. *drehen.*

Thunder. **stan**, to sound, to thunder; **stanayitnu**ˢ, thunder. Cfr. *tono, tonitru;* g. *donner;* d. *donder;* sw. *dunder;* it. *tuono;* fr. *tonnerre.* v. Tone.

Thwart. (v. Vert-.) **dhvr**, to bend, to make crooked.

Tick. Tie, Tig, Tigh, Tight. v. Tack.

Tierce. v. Three.

Tile. (ags. *tigel.*) v. Deck.

Till. **tul**, to resemble; **tal**, to fix, to establish; **til**, to go.

Timber. v. Dome.

Time. v. Temp-. [*timor.*

Timid, Timo-. **tam**, to desire, to be distressed. Cfr. τιμάω; *timeo,*

Tinder. **da.h**, to burn; **indh**, to kindle.

Tine. v. Dent-.

Tingle, Tinnient. v. Tone, Sing.

-Tinguish. (dis-, ex-.) v. Tang.

Tinsel. **ta.s**, to adorn.

Tiny. **tu'n**, to shrink. v. Thin.

Tire. v. Ter-.

Tissue. v. Technic.

Titan. **tat**, to be high or elevated.

Tithe. v. Dec-.

Title. (*titulus.*) **tul**, to resemble, to weigh or measure.

To. v. Ad-.

Toad. **tudd**, to despise.

Toe. v. Digit.

Toga. v. Deck.

Together. v. Gather.

Toil, Tol-, TOLL. **tful**, to raise, to elevate; **tul**, to weigh or measure; **dul**, to raise, to throw up. Cfr. *tollo, tuli, tolero.* v. Deal,

TOKEN. v. Dic-, Sigil-. [Tel-, Till.

Tomb. **da.b**, to heap up. Cfr. טמכ to stop or close up; τύμβος; *tumeo, tumulus;* w. *tom, twm;* fr. *tombe.*

TONE. **tan**, to spread, to extend; **ta'nas**, a tune. Cfr. τείνω, τόνος; *tono, tonus;* g. sw. fr. *ton;* d. *toon;* it. *tuono.*

Tongs, Tongue. **ta.g**, to move, to tremble; **ta.dʒ**, to shrink or contract. Cfr. goth. *tuggo;* g. *zunge;* d. *tong;* sw. ags. *tunga.*
Too. **tu**, but, again, and. v. Ad-.
Tool. (fr. *outil.*) v. Use.
Tooth. v. Dainty.
Toot. **tus**, to sound.
Tornado. **drun**, to make crooked, to approach.
Torrent. **tarantas**, a hard shower.
Torrid. v. Dry, Thirst.
Toss. **tas**, to toss.
Tot. **ta'tas**, a term of affection for any one, especially for juniors.
Touch. v. Tact.
Towel. **dha'v**, to wash.
Tr-, Tra-, Trans-. v. Ter-.
Trace, Tract. v. Drag.
Trade. **tra.d**, to act, to be busy.
Tram. **dram**, (*δραμεῖν.*) to go.
Tramp, Trap. **tru.p**, to hurt or injure.
Trapes. **trapa'**, an unchaste woman.
Travail, Travel. **pal, val**, to go.
Tread. v. Ter-, Throw.
Treasure. **tras**, to hold, to seize or take.
Treble. v. Three.
Tree. **tarus, drus**, a tree. Cfr. *δρῦς, δένδρον; trabs;* goth. *triu;* ags. *treo.*
Trem-, Trep-. **dram**, to go, to move; **drbh**, to fear; **trap**, to be modest, to be ashamed. Cfr. *tremo, trepidus.*
-Tress. (dis-.) **tras**, to fear, to terrify, to tremble, to hold.
Trestle. v. Truss.
Tret, Trethings. **trut**, to cut, to break. v. Ter-.
Trey, Tri-. v. Three.
Tribe. **trapa'**, family, race.
-Tric-. v. Drag.
Tripod. **tripada**, a tripod.
Trist. **trastas**, timid, fearful.
Troth, Trow. v. True.
Trouble. **drbh**, to fear, to give pain. [*trovare;* fr. *trouver.*
Trover, Trowel. **durv, dhurv**, to strike. Cfr. g. d. *treffen;* it.
Trowsers. v. Truss.
Truce, True. **dhr**, to continue, to hold; **dhru**, to be firm or fixed;
-Trude. v. Thrust. [**dhruvas**, fixed, certain, ascertained.
Trull. v. Str-.

Trump. **tu´ra**$_{s}$, any musical instrument; **tu´ri´**, a trumpet.
Trun-. v. Run.
Trunk. **dṛ̥h**, to grow.
Truss, Trust. **tras**, to fear, to hold, to seize or take; **dhṛ̥ſ**, to be bold.
Try. v. Ter-. [*tumor, tumidus.*
Tu-. **tu**, to increase, to hurt, to become full. Cfr. *τύλος*; *tuber*,
Tuck. v. Tack.
-Tude. **tud**, to strike. Cfr. *tundere, tud-, tus-.*
Tumult. **tumulas**, uproar.
Tune. v. Tone.
Tunic. **tan**, to extend; **ava-tan**, to cover. v. Ten-.
Tup. v. Tap.
Tur-. **tur, tvar**, to hasten; **tarb**, to move. Cfr. *τύρβη*; *turba, turma.*
Turn. v. Tornado.
Turpentine. v. Tar.
Turpitude. **trapas**, shame.
-Tus-. v. -Tude.
Twang. **dhvaṇ**, to sound.
Twain, -Tween, Twin, Two. v. Deuce.
Twinge, Twitch. **tva‚tſ**, to go, to move.
Twink. **tviſ**, to shine.
Tympan, Type. v. Tap. [*uber.*
Uber-, Udder. **u´dhas**, an udder; **udara**$_{s}$, the belly. Cfr. *οὖθαρ*;
-Ult-. **ut, uttaras, uttamas**, up, upper, uppermost, best; **ati**, over, beyond. Cfr. *ὕστερος, ὕστατος*; *ultra, ulterior, ultimus, opti-*
Umbil-. v. Navel. [*mus.* v. Old, Oust.
Um-bra-. **vṛ̥**, to cover.
Um-pire. v. Emperor. [solitary. v. A-, An-, A, An, On.
Un-. **u´n**, to diminish; **yu**, to unite; **yu´nis**, union; **va´ṇas**, alone,
Uncial. v. Hook.
Undated. v. Hyd-.
Under. **adharas**, below.
Unguent, Unction. v. Oint.
Ungulate. v. Nail.
Up. v. Over.
Uran-, Urn. **vṛ̥, u´rnu**, to cover. Cfr. *οὐρανός*. v. Oru-.
Urge. v. Org-.
Urine. **va´ri**, water. Cfr. *οὖρον*; *urina.*
Ursine. v. Arctic.
Us. **asma´n**, us. [fr. *user*; it. *usare.*
Use, Utensil, Util-. **yat, yas**, to persevere. Cfr. *ἔθω*; *utor, usus;*
Usher. **iſ**, to go.

Usquebaugh. v. Whiskey.
Ust-. v. Ash.
Usurp. v. Serp-.
Uter-. v. Udder.
Utmost, Utter. v. Out. (**ud-i´r**, to send forth.)
Vac-, Vag-. **vi´**, **vacc**, **va¸c**, **vag**, **vadȷ**, to go; **vahataˢ**, an ox; **vatsaˢ**, a calf. Cfr. *vaco, vacuum, vagus, vacca, vitula;* fr.
Vacillate. **vi-tfal**, to vacillate. [*vague.* v. Ox.
Vague. **va´gyaˢ**, doubt.
Vail, Vale. **val**, to cover, to surround or enclose, to go. Cfr. *velo, velum, vallis, vallum, valor, valvæ, velox;* fr. *voile, val;* g. *wall;* ags. *weal.* [*validus.*
-Vail, (pre-, a-,) Val-. **bal**, to live, to be strong. Cfr. *vale, valeo,*
Van-. **ven**, **va¸tf**, to go. Cfr. *βαίνω; vanus, vanesco, venio;* fr. *venir.*
Vapor. **va´fpaˢ**, vapor.
Varic-. **variſthaˢ**, largest.
Varnish. **varn**, to color, to spread or extend; **vr**, to cover.
Vary. **vr**, to select; **va´raˢ**, a multitude.
Vassal. **vaga˂**, subdued.
Vast-. **vast**, to devastate, to move, to kill; **vyastaˢ**, pervaded, spread. Cfr. *vasto, vastus;* ags. *westan;* it. *guastare.*
Vase, Vat. **vat**, to surround, to speak. Cfr. *vates;* d. *vat;* ags. *fat.*
Veal. v. Vac-.
Vec-. v. Veh-.
Ved-. v. -Vide. [*ὑγιής; vegeo, vigor, augeo.* v. Auction.
Veg-. **odȷ**, to live, to be strong; **vadȷ**, to move, to prepare. Cfr.
Veh-. **vah**, to carry, to convey. Cfr. *veho, via, vehemens, vehiculum;* goth. *vegs, vigs;* g. *wagen, weg;* it. *vettura;* fr. *voiture.*
Veil, Vel-. v. Vail. [v. Vac-.
Vend. **van**, to transact business. Cfr. *ὠνος; veneo, vendo.*
Vener-. **van**, to serve, to honor. Cfr. *ϝονημι; venero, Venus.*
-Vene, Veney. **ven**, to go, to move. v. Van-.
Venge. **van**, (**vanayati**,) to injure. Cfr. *vindico;* fr. *venger.*
Vent-. **va´**, **va´t**, to go, to blow; **va´taˢ**, **va´tiˢ**, air, wind. Cfr. *ϝαυρα; ventus, ventilo;* goth. *vaia, vinds;* g. *wind;* fr. *ventiler.*
Ventr-. v. Enter, Udder.
Venus. **ven**, to seek, to love.
Ver-, -Vere. v. Guard.
Veranda. **varandaˢ**, a portico.
Verb. **bru´**, **vrdh**, **vrt**, to speak; **svar**, **svr**, to sound. Cfr. *ϝερέω; verbum;* goth. *vaurd;* g. *wort;* ags. *word.*

VERD-. **vṛdh**, to grow; **haris**, **harit**, green. Cfr. *viridis;* fr. *verd.*
Verge. **vṛdȷ**, to shun, to avoid.
Verm-. v. Worm.
VERS-, VERT-. **vṛ**, to cover, to surround; **vṛt**, to turn, to excel, to be fixed or stable; **vṛtta**,, verse, metre. Cfr. *vertere, versus, vortex;* fr. *environ;* goth. *vairths;* g. *werth;* ags. *wurth.*
Very. **bhu´ris**, much; **urus**, great. (A.)
Vesper. **divas**, day; **para**, subsequent. Cfr. ἑσπέρα; *vesper.*
Vessel. v. Vase. [goth. *vasti;* fr. *veste.*
VEST. **vas**, to clothe; **vastra**,, clothes. Cfr. ἕσθος; *vestis, vestio;*
Vet-. **vi´tas**, gone, departed. Cfr. *vetus.*
Veto. **vad**, to speak.
-VEX, -VEY. (con-, de-.) v. Veh-.
Vex. **bhicſ**, to be weary or distressed.
-VIATE, -VIOUS. **vi´**, to go, to move. v. Way.
Vibrate. **vabhr**, to go, to move.
Vice. **viſ**, **vit**, fæces, ordure. Cfr. *fæces, fœteo, vitium.*
Vicar. **vicṛtas**, altered, changed. Cfr. *vicarius, vice, vicissitudo.*
Vicinage. **vitſh**, to approach. [*vis-.*
VID-. **vid**, to know; **bud**, to perceive; **i´ſ**, **viſc**, to see. Cfr. *video,*
-Vide. v. Wide.
VIDUAL. v. Widow.
Vig-. v. Veg-.
Vile. v. Evil, Foul.
Villa. **vil**, to cover; **vila**,, a cave.
Villous. v. Fleece.
Vindic-. v. Venge. [*vir, virtus;* goth. *vair.*
VIRAGO, VIR-. **vi´ras**, powerful, robust; **vi´ra´**, a matron. Cfr.
Virent, Virid-. v. Verd-.
Viru-. **viſ**, to pervade; **viſas**, poison. Cfr. ἰός; *virus.*
VIS-. v. Vid-, Vicar. [*visiter*
VISIT. **viç**, to enter, to pervade. Cfr. *viso, visito;* w. *gwest;* fr.
Vital. **vid**, **vṛt**, to be, to exist; **dȷiv**, (**dȷi´vitas**,) to live.
Viti-. v. Vice.
Vitr-. **vid**, to break; **vida**,, manufactured salt.
Vituline. v. Vac-.
Vituperate. v. Tap-.
Viv-. v. Vital. [fr. *voyelle, voix;* it. *voce, vocale;* sp. *voz.*
VOC-, VOICE. **vatſ**, to speak. Cfr. *vox, voco, vocalis, vocabulum;*
Vogue. v. Vac-.

VOID. **vi**, a privative particle; **vid**, to divide, to break. Cfr. *viduus;*
Voiture. v. Veh-. [it. *voto;* fr. *vuide.* v. Wide.
Vol-. **val, vel, vli′**, to go; **vṛ**, to choose; **vi′**, to desire. Cfr. *volo;* fr. *voler, vouloir;* goth. *viljan;* g. *wollen;* d. *willen;* ags. *willan.*
Volcano. **ul**, to burn. [fr. *vomir.*
VOMIT. **vam**, to vomit; **vamathuˢ**, vomiting. Cfr. *ἐμέω; vomo;*
VORTEX. v. Vert-.
VOUCH, VOWEL. v. Voc-.
Vot-, Vow. **va′t**, an exclamation on making an offering of boiled butter; **vaṭ**, to divide, to speak. Cfr. *votus, votum;* it. sp. *voto;* fr. *votif, vœu.* v. Wish.
Voyage. **vadʒ**, to go. Cfr. ags. *wœg;* ags. g. *weg;* fr. *voie, voyage.*
VULGAR. v. Fill.
Vuln-. **vraṇ**, to wound. Cfr. *vulnus;* fr. *vulnerable;* goth. *vunds.*
Vulpine. **vṛcaˢ**, a wolf; **valbh**, to eat. Cfr. *λύκος; lupus, vulpes;* goth. *vulfs.* [v. Water.
Waddle, Wade. **ba′d**, to bathe. Cfr. *vado;* g. *waten;* d. *waaden.*
WAG-. **va,g, vadʒ**, to go. Cfr. g. *wagen, bewegen;* d. *waagen, beweegen;* ags. *wagian, wecgian.* v. Vacillate, Veh-.
Wages. **vetʃa′**, wages.
Waif, Waft. **vap**, to sow, (in composition, to scatter). [*guaiolare.*
Wail. **hve**, to call. Cfr. *οὐαί; væ;* ags. *wa;* g. *weh;* it. *guai,*
Wain. v. Wag-.
Waist. **vas**, to divide. v. Bust.
WALK. **vargh, valg**, to go.
WALL. v. Vail.
Wallow, Waltz. v. Vol-.
Wan, Wane. v. Un-, Van-, Faint.
Wander. **va,th**, to move alone.
Want. **tʃha,da,**, wish, desire. v. Wan, Wish.
War. **vairaˢ**, hostility; **ha′raˢ**, war.
Ward. v. Vers-, Ware.
Ware, Warn, Warrant. **vṛ**, to screen, to choose, to prepare. Cfr. ags. *war, ware, warnian;* g. *warnen.* v. Guaranty.
-Wark. v. Org-. [d. *warm.*
Warm. **gharmaˢ**, heat. Cfr. *θέρμη; fermentum, ferveo;* goth. g.
Wart. **vṛ**, to cover. Cfr. *verruca;* fr. *verrue;* g. *warze;* ags. *weart.*
WAS. **vasati**, was.
Wash. **ucʃ, viʃ**, to sprinkle. Cfr. g. *waschen;* ags. *wæscan.*
WASTE. v. Vast-.

Water. **uda**$_{,}$, **udaca**$_{,}$, water; **uttaˢ**, wet. Cfr. g. *wasser;* d. *water.*
Wattle. **vaṭ**, to surround, to tie. [v. Hyd-.
Waul. v. Wail.
Wave. v. Wag, Waif.
Wax. v. Auction.
Way, Weak. v. Veh-.
We. **vaya**$_{,}$, we.
Weal. v. -Vail. [sw. *vapen.*
Weapon. **vap**, to shave, to scatter. Cfr. ags. *wepn;* g. d. *wapen;*
Weather. **vaˊ**, to blow; **tra**, suffix of ageney. v. Ether.
Weave, Web, Weft. v. Abb.
Wed. **vid**, to marry; **uˊdhaˢ**, married. [d. *waanen.*
Ween. **ven**, to refleet, to discern. Cfr. ags. *wenan;* g. *wähnen;*
Weet. v. Wit.
Weigh. **vidJ**, to separate or divide, to shake or tremble. v. Veh-, Wag.
Well. **velaˊ**, tide, flow; **villa**$_{,}$, a pit. v. -Vail.
Welkin. **valaˊhacaˢ**, a eloud. Cfr. ags. *wole, wolcen;* g. *wolke.*
Wend. (ags. *wendan.*) **vandi**, a ladder.
Werth. v. Vert-.
West. **vasatiˢ**, night; **astaˢ**, sunset.
Wet. v. Water.
What, Wh-. **caˢ**, **caˊ**, **ci**$_{,}$, who, which, what; **ut**, **tvat**, what; **cva**, where; **cataraˢ**, which of two, whether. Cfr. *quis, quid;* goth. *waiht;* g. *was;* d. *wat;* dan. sw. *hvad;* ags. *hwæt;* fr. [*qui, que;* it. *chi, che.*
Wheel. **hval**, **vel**, to move, to shake.
Wheeze. v. Whistle.
Whelm. **hul**, **val**, to cover.
Wherry. v. Ferry.
Whether, Which. (**vitʃ**, to separate, to discriminate.) v. What.
While. **cal**, **vel**, to count or declare the time. **caˊlaˢ**, **velaˊ**, time. Cfr. goth. *hweila;* g. *weil;* d. *wijl;* ags. *hwile.*
Whine. **hve**, to eall; **van**, **dhvan**, **svan**, **cun**, **cvan**, to sound. Cfr. כנר a harp or organ; *χινρός; hinnio;* goth. *qvainon;* g. *weinen;* ags. *cwainan.*
Whip. **vip**, to throw; **vep**, to shake or tremble. v. Vibrate.
Whirl. v. Vert-.
Whish, Whisper, Whist. v. Tacit, Whistle.
Whisk. **vasc**, to go.
Whiskey. **vifa**$_{,}$, water. Cfr. ir. *uisge;* w. *wysg*
Whistle. **ɕvaˢ**, to breathe. Cfr. *fistula;* ags. *hwisprian, hwistle.*
Whit-tle. v. Cut.

WHITE. **ϛvit**, to be white; **ϛvetaˢ**, white. Cfr. goth. *hveits;* g. *weiss;* d. *wit;* ags. *hwit.*

Whither, Who. v. Wh-, Whether, What.

Whole. v. Hail.

Whor-. v. Vert-.

Whore. **dʒa′raˢ**, a paramour; **va′rasvi′**, a harlot.

Why. v. What.

Wick, Wich. v. Eco-.

Wicked. v. Vac-.

WIDE, WIDOW. **vid**, to divide; **vidhava′**, a widow. Cfr. בר to separate; *di-vido, viduus, vidua;* goth. *vidwo;* ags. *wid, widew;* g. *weit, wittwe;* d. *wijd, weduwe;* it. *vedova.*

Wife. v. Weave.

Wild. v. Vail.

Will. v. Vol-.

WIN. **vinnaˢ**, gained.

Wind, Winnow, Winter. v. Vent-.

Wind. **va‸d**, to surround or encompass.

Wing. **va′dʒa„**, a wing.

Wire. v. Vir-.

WIS, Wise, WIT, Witch. **vid**, (**vetti**,) to know, to dwell, to be fixed or steady; **viϛ**, to enter, to pervade, (in composition,—to dwell, to place, to rest;) **viϛeʃaˢ**, sort, kind, manner. Cfr. *εἴδω; video;* goth; *vitan;* ags. *wis, witan;* g. *weise, wissen;* d. *wijs, weeten;* sp. it. *guisa;* fr. *guise.*

Wish. **iʃ, va′‸cʃ, va′‸tʃh, vaϛ**, to desire. Cfr. goth. *vens;* g. *wünschen;* d. *wenschen;* dan. *önsker;* sw. *önska;* ags. *wiscan.*

With, Withe. **vitaˢ**, a branch and its shoot; **vat**, to surround, to tie. Cfr. *vitis, vitex;* goth. *gavithan;* g. *wider, weide;* ags. *with, withig.* v. Meta-.

Wither. **vi‸t**, to perish, to decay.

Wizard. v. Wis.

Woe. v. Wail.

Wolf. v. Vulpine.

Woman. v. Fem-.

Wonder. **va‸d**, to worship, to praise.

Woo. (ags. *wogan.*) **va′h**, to endeavor. v. Wish.

Wood. **iddhma„**, fuel.

Wool. v. Fleece.

Word. v. Verb.

Work. v. Org-.

Worm. **crmiˢ**, a worm, an insect. Cfr. *vermis;* ags. *wyrm;* g. *wurm;* d. *worm.*

Worse, Worth. v. Vers-.

Wor-ship, Wr-. v. Ver-.

Wort. v. Orchard.

Wot. v. Wis.

Wound. **vu̯dh**, to hurt or injure. Cfr. g. *wunde;* d. *wond;* ags. *wund.*

Wrath. v. Irate.

Wreath. v. Vert-.

Wreck. v. Bray.

Wrench, Wretch, Wriggle, Wrinkle. **vrtʃ, vrdʒ**, to quit, to shun; **vrdʒanaˢ**, crooked, wicked.

Wrestle, Write, Writhe, Wry. v. Vers-.

Wright. v. Work.

Wurzel. v. Orchard.

Yacht, Yager. **ya´**, to go.

Yak. v. Ox.

Yard. v. Garden.

Yawn. v. Chasm.

Ye. v. You.

Yean. v. Gen-.

Year. **i´r**, to go; **va´ra**,, a time. Cfr. zend. *yâre;* g. *jahr;* d. *jaar;* ags. *gear.*

Yearn. v. Earnest.

Yeast. (ags. *gist.*) v. Gas.

Yell. (ags. *gyllan.*) v. Call.

Yelk, Yellow. **dʒval**, to shine, to flame; **gaura**,, white, pale red, yellow, gold. Cfr. *gilvus, helvus;* ags. *gealew;* g. *gelb;* d. *geel;* nor. *jaulne;* fr. *jaune;* it. *giallo;* sp. *jalde.*

Yelp. **dʒalp**, to speak, to prattle. Cfr. ags. *gealpan;* dan. *gylper.*

Yeoman. v. Common.

Yes, Yea. v. Aye.

Yester-. **hyas**, yesterday. Cfr. *χθές; hesternus;* goth. *gistra;* g. *gestern;* d. *gisteren;* ags. *gystern.*

Yet. **yat**, since, wherefore.

Yoke. **yudʒ**, (**yuctaˢ**,) to join; **yugaˢ**, a yoke. Cfr. *ζυγόν, ζεύγ-; jugum, jung-, jux-;* goth. *juk;* g. *joch;* d. *juk;* ags. *geoc;* it. *giogo;* sp. *yugo;* fr. *joug.*

Yolk. v. Yellow.

You. **yu´ya**, you.

YOUNG, Youth. **yuvan**, **yu´ni´**, young. Cfr. *juvenis*, *junior*; goth. *juggs*; g. *jung*; d. *jong*; ags. *geong*; fr. *jeune*.

Zeal. **ȝal**, to run.

Zeugma, Zygo-. v. Yoke.

Zocco. v. Sock.

ERRATA.

For **f** and **j**, wherever they may occur, read **ſ**, **ȷ**.

In the Greek font, the character used for a final sigma, is **ς**.

In the Hebrew font, the following letters are somewhat *pied*: ך ן; ם ס; נ ג; ר ד.

The dots in **ṛ**, **ṛ´**, and other letters, are sometimes omitted.

Page 13, line 26, for אבש, read אנש.
" 24, " 13, " רגע, read רוץ.
" 28, " 39, " קכה read קנה.
" 35, " 14, insert a comma after "family."
" 45, " 7, for *δεξιός*, read *δεξιός*.
" 45, " 36, " *divus*, read *dirus*.
" 54, " 13, " Fend-, read Feud-.
" 60, " 3, " pain, read pair.
" 63, " 15, " *gvens*, read *qvens*.
" 65, " 29, insert **hiḍ**, to go, to move.
" 76, " 8, for *miracalum*, read *miraculum*.
" 76, " 40, " Sepho-, read Sopho-.
" 78, " 9, " g. *naakt*, read d. *naakt*.
" 80, " 19, " *υἶδα*, read *οἶδα*.
" 81, " 25, " other, read otter.
" 83, " 41, " *piguus*, read *pignus*.
" 89, " 40, " Qaadr-, read Quadr-.
" 90, " 22, " Qviver, read Quiver.
" 96, " 5, " Scabble, read Scrabble.
" 96, " 28, " *"εζωμαι*, read *"εζομαι*.
" 101, " 15, " Snade, read Suade.
" 104, " 19, " Snav-, read Suav-.

(Continued from p. 176.)

Another exactly similar retort-house, standing within ninety feet of the one destroyed, as well as several smaller buildings around, was left comparatively uninjured. The conjecture was ventured that the waves of the gust may have corresponded in time with the normal vibrations of a roof of that particular shape and area. Upon this possibility, when the building is reconstructed, such isochronous vibrations will be guarded against by a lattice-work of horizontal braces from wall to wall, at an angle of forty-five degrees from end to end of the building, stiffened by girders. In attempting to escape, two of the workmen were killed; the rest, paralyzed by terror, crouched on the floor, and were all saved. The building fell forward, in the direction of the wind, the roof falling partly outside of the fallen walls. Professor Cresson contrasted those narrow, vortical, undulatory meteors which prove so destructive when they traverse the American forest. Mr. Lesley described the Medford (Mass.) storm of 1851, in which the undulation of the tornado was rendered visible from each side of its track by the column of mud which it absorbed and held suspended in the air.

The minutes of the Board of Officers and Members of Council were read; and, on motion of Prof. Cresson, the resolution, recommended for the adoption of the Society, was discussed, and, on motion of Judge King, postponed to the next meeting.

Pending nomination, No. 397, was read.

The chairman of the Committee on the Hall reported the selection and purchase of a carpet, and moved that the committee have authority granted them to renovate the principal room of the Society and the Librarian's room, which was granted.

On motion of Mr. Fraley, the Librarian was authorized to comply with the request of the Librarian of the Toronto University, and furnish Nos. of the Proceedings from No. 59 onward, and place the Toronto University upon the list of Corresponding Societies.

And the Society adjourned.

Stated Meeting, March 2, 1860.

Present, twenty members.

Professor CRESSON, Vice-President, in the Chair.

Mr. Aubrey H. Smith, a newly-elected member, was presented, and took his seat.

Letters were read from the Public Library at Boston, acknowledging the reception of Part 2, Vol. xi of the Transactions, and from W. Polman, of the University of New York, which was referred to the Librarian, with power to take order.

The following donations for the Library were announced:—

Ann. Rep. (8th) Free Pub. Lib. New Bedford.—*From the Trustees.*
African Repository, xxxvi, No. 2.—*From Amer. Col. Soc.*
Proc. Acad. N. S. Philada. 1860. Sig. 1.—*From the Academy.*
Monthly Notices R. Astron. Soc. xx, No. 3.—*From the Society.*
Astronomical Journal, Cambridge, Mass. vi, xi.—*From the Editor.*
Hayes's Arctic Boat Journey. Boston, 1860. 8vo.—*From the Author.*
Report Supt. U. S. Coast Survey for 1858. 4to.—*From the Supt.*

HALLOWELL (EDWARD). Mr. Foulke announced the death of Dr. Edward Hallowell, a member of the Society, who died February 20, 1860, æt. 51; and, on motion of Judge Sharswood, Mr. Foulke was appointed to prepare an obituary notice of the deceased.

Mr. Lesley drew the attention of the members present to the geological account of the Arctic Archipelago, affixed by the Rev. Samuel Haughton, President of the Geological Society of Dublin, to Capt. McClintock's Narrative. The coal measures of the extreme north land of America are therein described as older than the carboniferous formation; as succeeding the upper silurian limestones; containing numerous beds of highly bituminous coal, with one fossil shell,—the Atrypa fallax of the carboniferous shale of Ireland; finally, as overlaid by a series of blue limestone beds full of characteristic carboniferous marine shells, among which occurs the

Terebratula aspera (Schlotheim) of the Eifel. President Haughton says, "It is therefore highly probable that the coal-beds of Melville Island are very low down in the series, and do not correspond in geological position with the coal-beds of Europe, which rest on the summit of the carboniferous beds." The coal itself in some respects resembles some of the gas-coals of Scotland, which form a system older than that of the South Welsh coals. The corals, collected apparently from the same beds, are a curious mixture of silurian and carboniferous types. "The same blending of corals has been found in Ireland, the Bas Boulonnais, and in Devonshire." He concludes by saying, "I do not believe in the lapse of a long interval of time between the silurian and carboniferous deposits,—in fact, in a Devonian period."

Mr. Lesley described the subconglomeritic or false coal measures, first recognized stratigraphically by Dr. R. M. S. Jackson in Northwestern Virginia, in 1841, and botanically by Leo Lesquereux, in 1851; the system being best developed in Wythe and Montgomery Counties in Southern Virginia, in Southeastern Kentucky, and in Nova Scotia. He considered it probable that this earlier carboniferous era, illustrated in Ireland, Scotland, and elsewhere further east by workable coal-beds, would determine the age of the Arctic coal-field. The carbonaceous slate deposit of the lowest Devonian rocks, such as have been searched for coal in Perry and Juniata Counties, Pennsylvania, and have actually yielded thin coal-seams in Western New York, may better represent the German Devonian coal-measures.

Stated Meeting, March 16, 1860.

Present, sixteen members.

President Dr. Wood, in the Chair.

Letters were read from the Oberlausitzischen Gesellschaft, dated Görlitz, Dec. 21, 1859, requesting information; from

the Chicago Historical Society, dated February 29, 1860, desiring to form and sustain friendly relations with the Society; and from the Editor of the Gas Light Journal, dated New York, March 13, 1860, offering to sell a printing press, said to be the one on which Benjamin Franklin worked when a boy of fourteen years of age. On motion of Mr. Fraley, the offer was declined. On motion of Dr. Bache, the Chicago Historical Society was placed on the list of corresponding societies.

The following donations for the Library were announced:—

Reinwald's Catalog. Annuel. Vol. ii. Paris, 1859.—*From the Author.*
Bulletin Soc. Geog. Paris, xvii. Jan. to June, 1859.—*From the So.*
Robinson's Armagh Cat. of 5345 Stars. 8vo. 1859.—*From the Aut.*
Cat. of Printed Books of N. Y. Hist. S. Lib. 8vo. 1859.—*From So.*
Journal of the Franklin Institute, No. 411.—*From the Institute.*
Mayor Henry's 2d An. Mes. Phil. 1860.—*From City Councils.*
African Repository. March, 1860.—*From Amer. Col. Society.*
Saggio di Ditterologia Messicana di Luigi Bellardi. Part 1. 4to. Torino, 1859.—*From the Author.*

Mr. Lea read a letter from Dr. James Lewis, of Mohawk, N. Y., accompanied by drawings descriptive of a self-registering thermometer, registering on a fillet of paper, with a pricking point, at intervals as short as fifteen minutes if desired.

REGISTERING THERMOMETER. BY JAMES LEWIS, MOHAWK, N. Y.

The apparatus, for convenience of description, may be divided into three parts.

First. The Thermometer, consisting of a bundle of iron and brass wires (No. 13 wire measure), which bundle comprises, within a length of *about* 15 inches, the equivalent of about 45 inches of iron wire antagonized by an equal length of brass wire. These wires are arranged *around* a centre, instead of being placed in alternate pairs each side of a centre, for the purpose of making each individual wire contribute its share of stiffness to the stiffness of the whole bundle; also for the purpose of giving equal rigidity to the *circular plates* which

connect the wires at their extremities, so as to avoid as much as possible the elasticity which is being constantly multiplied by arranging the rods at unequal distances from the centre in a straight line each side of the centre.

The whole number of rods or wires in the bundle is eleven, six of these (in three pairs) are iron, and on these the force of *compression* is exerted. The force of extension is applied to four brass wires (two pairs), arranged alternately with the iron wires around the centre, and also to a single brass wire in the centre (which single brass wire is the equivalent of a pair).

It will be seen that the above arrangement makes the first pair of iron rods form the *base* of the Thermometer, and the last (single) brass wire the terminus.

The base of the bundle of rods is secured against a proper foundation in a *pendant* position: on this foundation is placed the support for the fulcrum of a very strong lever, bearing on knife edges. The short arm of the lever is connected with the central brass wire of the bundle, and multiplies the *difference* of the rates of expansion of the two metals composing it eight times; a second lever still further repeats this five times. The long arm of the second lever, by means of a chain (made of flat links and rivets), communicates movements to a pulley resting on friction wheels, which pulley is made in two parts, one of which is eight times larger than the other (allowance being made for the semi-diameter of the chain on the smaller portion of the pulley).

A slender silk cord runs over the larger part of the pulley and sustains a delicate weight, which is guided between two slender parallel rods (brass wire No. 32 wire measure), which parallel rods are kept in tension by means of springs.

The above comprehends the essential features of the Thermometer. All the parts should be constructed with as much nicety of adjustment as a fine watch, and with the exception of the two metals in the rods, and perhaps the knife edges and shafts or pivots of the friction wheels, the whole work should be of brass, of a uniform quality and temper as near

(Continued on page 316.)

BIOGRAPHICAL NOTICE OF THE LATE THOMAS NUTTALL.

Thomas Nuttall, an Englishman by birth, but an American by his scientific labors and reputation, was born in 1786, in the market-town of Settle, in the West-Riding of Yorkshire, of parents apparently in humble circumstances. At an early age, and scarcely possessing anything more than the rudiments of education, he was apprenticed to the printing business, either in his native town or in the city of Liverpool, where he had an uncle engaged in the same occupation.

Nuttall resided several years in Liverpool, working as a mere journeyman printer. A misunderstanding with his relative, upon whom he was somewhat dependent, induced him to leave that city and go to London in search of employment. There he met with troubles and pecuniary embarrassments, being sometimes, as he has related himself, so destitute of money as to be uncertain, on going to bed, where he would get his breakfast next morning. A love of the natural sciences, he said,—and perhaps also a hope to improve his position in the world,—brought him to the United States in 1808, when only twenty-two years of age.

Young Nuttall was endowed with a strong, clear intellect; his mind was of a meditative cast, and his thoughts were more particularly bent towards the contemplation of the great works of Nature, which became the objects of his investigations for the remainder of his life. Those who remember him, at the period of his arrival in Philadelphia, speak of him as being already a well-informed young man, possessing the language and history of his country, and somewhat familiar with some branches of natural history, and even with Latin and Greek. Such an acquisition of knowledge in a youth of twenty-two, who, at a tender age, had been removed from the benches of a village school to be apprenticed to a mechanical occupation,

calls forth the natural inquiry, "How did that young man find time to study?" The inference may justly be this: his hours of rest from labor, his hours of recreation and sleep were diligently employed in the pursuit of knowledge. Nay, at the very printing-case do we fancy to see him carrying books and stealthily devouring their pages.

These studious habits, which elevated him finally to the high rank he attained in sciences, followed him throughout his long career. When, in 1824, Prof. Torrey was preparing for publication his Flora of the Northern and Middle States, which he dedicated to his friend Thomas Nuttall, with high compliments, the printer who was engaged upon it asked the Professor who was that Nuttall so frequently referred to in his work, adding that he had once worked with a printer of that name, who spent the greatest part of his time in reading books, and he would not be surprised if he were the same man. Prof. Torrey rejoined, "that his surmise was correct; the printer of former times had proved a most arduous laborer in the field of science, and was now a distinguished botanist, and an officer of one of the first scientific institutions of the country."

Nuttall landed at Philadelphia in the spring of 1808. "In the ship Halcyon," does he say, emphatically, in the beautiful preface to his Sylva, "I arrived at the shores of the New World; and after a boisterous and dangerous passage, our dismasted vessel entered the Capes of the Delaware, in the month of April. The beautiful robing of forest scenery, now bursting into vernal life, was exchanged for the monotony of the dreary ocean and the sad sickness of the sea. As we sailed up the Delaware my eyes were riveted on the landscape with intense admiration. All was new; and life, like that season, was then full of hope and enthusiasm; the forests, apparently unbroken in their primeval solitude and repose, spread themselves on either hand as we passed placidly along. The extending vista of dark pines gave an air of deep sadness to the wilderness. The deer, brought to bay and plunging into the flood from the pursuit of the Indian,

alone seemed wanting, to realize the savage landscape as it appeared to the first settlers of this country."

That Nuttall had already devoted himself to the study of some branches of natural history, cannot be doubted. Mineralogy seems to have been his earliest and favorite study; but as to Botany, in which he has acquired his great reputation, it is evident, from the following anecdote, related by himself, that he was totally ignorant of its first principles. The morning after his arrival in Philadelphia, anxious to see the surrounding country, he crossed the High Street Bridge, and walked along the Lancaster Turnpike. In a marshy ground by the road his attention was attracted to a spot where a common Greenbrier (*Smilax Rotundifolia*) was creeping up a tree. Egad! said he to himself, there is a Passion-Flower; and he plucked some branches of it, which he brought home for inquiry. His fellow-boarders could not satisfy him, but referred him to a certain Professor Barton, a great botanist, whose residence was near at hand. Nuttall, without loss of time, and with the branch of the presumed Passion-Flower in his hand, called on Prof. Benjamin Smith Barton, and this first visit decided his vocation to the worship of Flora, to whose shrine he remained devoted to the last day of his life.

Prof. Barton received Nuttall with his usual politeness; and struck with the intellectual countenance of the young man, he invited him to a seat, and entered into conversation with him, pointing out the difference between the two genera, *Smilax* and *Passiflora;* and beginning a dissertation upon the principles of Botany, and the infinite pleasure which this beautiful science afforded to its votaries. Nuttall, on taking leave of the Professor, felt deeply impressed with the words that had fallen from his lips, and from that moment he determined to apply himself to the study of plants.

An intimacy between those two remarkable men was thus the consequence of a great botanical mistake in the future eminent botanist and great explorer of the North American Flora. It was then early in the spring of the year, and during the whole season of flowers, our enthusiastic young naturalist rambled over the neighboring fields, bringing his

treasures to his friend and patron, studying them with him, and preparing them for the herbarium. His earliest botanical excursions out of the vicinity of Philadelphia were in the lower part of the peninsula, between the Delaware and Chesapeake, and subsequently on the coast of Virginia and North Carolina. So zealous was he in the pursuit of his vocation, that he was deterred by no trifles. At the season of the year when, in the Southern swamps, the musquitoes were very numerous, and had made such an impression upon his face and hands as, unconsciously to himself, to give him the appearance of a man attacked with small-pox, upon approaching a habitation he was refused admittance by the people of the house, and with difficulty could he persuade them that he was only bitten by insects.

On his return from those explorations, he made the acquaintance of Mr. John Bradbury, a Scotch naturalist, who had come to America for the purpose of visiting the interior of the country, and to collect new objects of natural history. Nuttall, with eagerness, embraced this opportunity to gratify his ardent desire for distant travelling, and his passion for the study of Nature; he offered to accompany Bradbury, and his request was accepted. They started together from St. Louis with a party of traders and hunters, on the 31st of December, 1809, less than two years after his arrival in this country. They crossed the Kansas and Platte rivers, passed through different Indian tribes, reached the Mandan villages, where Lewis and Clarke had spent the winter of 1804 and 5, ascended still higher the Missouri River, and returned, after having experienced the greatest fatigues and dangers. They were pursued and robbed by the Indians, and Bradbury fell into their hands, and was very near being massacred by them; he only saved his life by taking his watch to pieces, and distributing the works among them as trinkets. As to Nuttall, overcome by fatigue and hunger, driven to despair in the midst of the wilderness, and unable to go a step farther, he laid himself down with resignation, and would inevitably have died, had he not been found by a friendly Indian, who

placed him in his canoe and rowed him down the Missouri River to the first settlements of the white men.

Nuttall returned to Philadelphia from this journey up the Missouri, in the beginning of 1811, bringing with him ample treasures of plants, seeds, minerals, and other objects of natural history. For eight consecutive years, he remained settled in our city, occupying his summer months in botanical excursions to the banks of the Ohio, through the dark forests and brakes of the Mississippi, to the distant lakes of the northern frontier, through the wilds of Florida, &c. During the inclement season, he employed his time in studying his collections, and preparing his materials for his admirable work, "*The Genera of the North American Plants.*"

Naturally reserved, little fond of company, and absorbed by his studies, his circle of acquaintance was very limited. Professor Barton, Messrs. Zaccheus Collins, Reuben Haines, Correa de Serra, a few other devotees of science, and three or four families of Philadelphia and Germantown, were the only persons whom he visited. To them he frequently spoke of his mother and a favorite sister, for whom he expressed great tenderness; otherwise, his habitual intercourse was with the principal horticulturists of the vicinity, with William Bartram, Col. Carr, with McMahon, to whom he dedicated his genus *Mahonia*, and others. The seeds of the numerous new species of plants, which he had brought with him from his explorations, he raised himself, and cultivated in their conservatories, with the view to study them more accurately, and distribute them to correspondents at home and abroad. He visited them alternately, spending sometimes with them several days at once. Col. Carr, the only surviving member of these old horticulturists, tells me that Mr. Nuttall had a room expressly reserved for him at his house, called *Nuttall's room*, which he occupied occasionally for a whole week.

In 1817, Mr. Nuttall, already a fellow of the London Linnean Society, was elected a member of the American Philosophical Society, and corresponding member of the Philadelphia Academy of Natural Sciences. This double election placed him at once in contact with the learned com-

munity and elite of the Philadelphia circles. He began, at that time, to publish scientific essays in the Journal of the Philadelphia Academy of Natural Sciences:—1st, *Observations on the genus Eriogonum, and order Polygonaceæ;* 2d, *An account of two new genera of Plants; of a species of Tillea, and another of Limosella, recently discovered on the banks of the Delaware, in the vicinity of Philadelphia.* 3d, *Description of Collinsia, a new genus of Plants*, dedicated to his friend and patron, Z. Collins.

The *Genera of the North American Plants* was published the ensuing year, 1818, in two vols. 12mo. Upon this work, principally, stands the reputation of Mr. Nuttall, as a profound botanist. Professor Torrey, in the preface to his Flora, justly remarks, "that it has contributed, more than any other work, to the advance of the accurate knowledge of the plants of this country." It is well known that he set up himself the best part of the types, and such was his accuracy in type composition, that some parts of his work were set up without a single error, and others, even without copy, reduced to writing.

Mr. Nuttall had long entertained the idea of visiting the regions of the Arkansas as a fresh field of exploration, promising to afford him an abundant harvest of new and interesting materials. In this enterprise he was assisted by Messrs. Correa de Serra, Z. Collins, Wm. Maclure, and John Vaughan, who procured him the means to perform this distant and hazardous journey.

He left Philadelphia on the 2d of October, 1818, and passing through Pittsburg, and down the Ohio and Mississippi, arrived at the mouth of the Arkansas River, on the 13th of January. He reached the post of Arkansas on the 22d following, and Fort Bellepoint on the 24th of April. There he left the river Arkansas to ascend on foot the Pottoe, one of its tributaries, and, with Major Bradford and a company of U. S. soldiers, he proceeded across the wilderness to the confluence of the Kiameska and Red Rivers. Hence he returned to the garrison of Bellepoint with abundant collections. Having there obtained accommodation in the boat of a gentle-

man, proceeding to a trading establishment at the confluence of the Verdigris River, one hundred and thirty miles distant, he ascended again the Arkansas up to the Grand River, and made an excursion to the Osage salt-works. On his return to the trading establishment of the Verdigris, he set out again on foot to the Salt Lake River, the western limit of his journey.

It was then the middle of August; the heat was excessive; but could not abate the unconquerable ardor of our explorer. At last, wearied by long and difficult marches, under the rays of a burning sun, suffering from thirst, insufficient food, as well as from exposure to the night dews; being, moreover, harassed by the necessity of constant vigilance, to avoid being entrapped by the neighboring Indians, his constitution sunk under so many trials of body and mind. He was seized with violent fever, among the Osage tribe, from whose treachery and dishonesty he experienced both losses of effects and perils of life, and was long deprived of the pleasures of his usual excursions. He finally succeeded, with much trouble and sufferings, in reaching the garrison of Bellepoint, where he remained sick until the 16th of October, when he started again to visit the hot springs of Washita. On the 3d of November following, he arrived at Fort Pecannerie, now Lewisburg, on his way home, and reached New Orleans on the 18th of February, 1820, his constitution much impaired. Thus did Nuttall, in his enthusiastic love of science, perform, in the space of sixteen months, an arduous and perilous journey of more than five thousand miles, mainly over a country never visited before by scientific explorers, and still in the undisputed possession of the wild Indian.

Mr. Nuttall had returned to his old quarters in Philadelphia, early in the spring of 1820. With his usual activity and perseverance, he went immediately to work, arranging his Arkansas collections, and preparing the narrative of his journey, which he published the following year, under the title of, *Journey into the Interior of Arkansas in* 1818 *and* 1819, with an Appendix, consisting,—1st, of *An Account of the ancient aboriginal Population of the Banks of the Missis-*

sippi; 2d, *A History of the Natches;* 3d, *Observations on the Chickasaws and Choctaws;* 4th, *Meteorological Observations.*

From 1820 to 1822, he contributed the following memoirs to the Journal of the Academy of Natural Sciences:—*A Geographical Description of the Valley of the Mississippi. Descriptions of rare Plants recently introduced into the Gardens of Philadelphia. Observations on the genus Orysopsis. Remarks on the Species of Corallorhiza indigenous to the United States. On the Serpentine Rocks of Hoboken, and the Minerals which they contain.* About the same time, he was also engaged in mineralogical studies, with some rude attempts at chemical analysis; and in delivering lectures on Botany to classes of young men. His style of lecturing was not remarkable for its eloquence, but he always succeeded in inspiring his pupils with his warmth and passion for his favorite science.

At the end of 1822, Mr. Nuttall was called to Cambridge, to fill, in the Harvard University, the place of the late Mr. Peck. He was not elected Professor of Natural History, but simply appointed Curator of the Botanic Garden, the fund of the Massachusetts Professorship of Natural History being insufficient for the support of a professor. Mr. Nuttall had consequently but light duties of instruction assigned to him. He delivered only occasional lectures on Botany to the students and residents of Cambridge; his time was almost exclusively devoted to the culture of rare plants and to his favorite studies, mineralogy and ornithology included. While at Cambridge, Mr. Nuttall led very much the same retired life that he had done in Philadelphia; he made few acquaintances, and the late Mr. James Brown was, perhaps, his only intimate friend. The house which he then occupied, and which is now the present habitation of the Professor of Botany, retains yet traces of some ingenious arrangements to favor his recluse habits.

During the first six or seven years of his residence in Cambridge, Mr. Nuttall paid a visit to Philadelphia in company with several gentlemen of Boston, on their way to the coal and iron districts of Pennsylvania. Joined by Dr. Pickering, they proceeded to Pottsville; hence over the mountains

to the Susquehanna, and up its west branch as far as the crossing of the Alleghany ridge.

Mr. Nuttall, aware that he was doing little for science, did not relish much his residence at Cambridge; he used to say that he was only vegetating, like his own plants. At last, his friend, Mr. Brown, induced him to write a work on Ornithology, a science which he had been cultivating almost since his arrival in this country. He set to work with great zeal, and, in 1832, produced his "*Manual of the Ornithology of the United States and Canada.*" That work, framed on Temminck's admirable treatise on European Ornithology, was published at Cambridge, in two volumes of about six hundred pages each, illustrated by excellent wood-cuts. It is written in elegant and graceful language, and is a production very creditable to Mr. Nuttall, and an evidence of the energy and perseverance with which he could apply himself, almost simultaneously, to the study of several branches of natural sciences. About the same time, appeared his "*Introduction to Systematic and Physiological Botany,*" a rare little book, which was favorably reviewed in Silliman's Journal. During his residence at Cambridge, he also published in the above journal the following papers, viz.: "*A Catalogue of Plants from Florida;*" "*Remarks on the Minerals of Paterson and Sparta, New Jersey;*" and his "*Reply to Mr. Seybert.*" In the Journal of the Academy of Natural Sciences, his "*Remarks and Inquiries concerning the Birds of Massachusetts.*" In the Transactions of the Philosophical Society, "*A Description of a new Species of Sarracenia.*" And in the American Journal of the Medical Sciences, "*An Account of the Jalap Plant as an Ipomœa,*" appended to a paper on the subject by Dr. R. Cox.

Towards the beginning of 1833, Mr. Nuttall returned to Philadelphia, bringing with him a collection of plants gathered by Capt. Wyeth, during a journey overland to the Pacific. Capt. Wyeth was soon to start on a second expedition, and Nuttall had decided to accompany him; but, not succeeding in obtaining a prolonged leave of absence from the college authorities at Cambridge to perform this long

journey, he concluded to resign his office of Curator of the Botanic Garden. During his short residence in our city, preparatory to his arduous journey across the continent, he was assiduously engaged at the Academy of Natural Sciences, studying Capt. Wyeth's plants, and preparing his memoir on those which he had collected himself in the interior of Arkansas. The result of these labors was the publication of several valuable papers in the Journal of the Philadelphia Academy of Natural Sciences: 1st. "*A Catalogue of Plants collected chiefly in the Valleys of the Rocky Mountains, towards the source of the Columbia River, by Nathan B. Wyeth.*" 2d. "*Collections towards a Flora of the Territory of Arkansas.*" 3d. "*Descriptions of some of the Rarer Plants indigenous to the United States.*"

Indeed, Mr. Nuttall was a most indefatigable laborer in the domain of science. From morning until night, he was seen working in the Academy, scarcely ever leaving his task to attend to his meals. There, at that time, I made the acquaintance of the great American botanist,—I say *American*, because no other name could be given to him, his reputation belonging to this continent, as he has specially been the illustrator of the North American Flora, and of no other. His appearance and manner made a lasting impression upon those who approached him. He was a remarkable-looking man: his head was very large, bald, and bore the marks of a vigorous intellect; his forehead expansive, but his features diminutive, with a small nose, thin lips, and round chin, and with gray eyes under fleshy eyebrows. His complexion was fair, and sometimes very pale from hard labor and want of exercise. His height was above the middle; his person stout, with a slight stoop; and his walk peculiar and mincing, resembling that of an Indian.

Nuttall was naturally shy and reserved in his manners in general society, but not so with those who knew him well. If silent or perhaps morose in the presence of those for whom he felt a sort of antipathy, yet, when with congenial companions, he was affable and courteous, communicative and agreeable. From long solitary study, the cast of his mind was contem-

plative and abstracted; but when doubts and difficulties were solved, he was apparently light and buoyant. "At the conclusion of a piece of work," says one who has been most intimate with him, "I have seen him rise from his chair, approach the stove, and, in his own peculiar way, put his hands behind his back, and, for an hour or two, pour forth a torrent of narrative and scientific facts on which was the cast of his own philosophical thoughts and conclusions. I have frequently seen him in social circles, when he was the delight of the company, from his cheerful and natural replies to all interrogatories, and his voluntary details upon the subject of his travels and adventures."*

I may be permitted here to relate a few anecdotes characteristic of the great naturalist. In one of his solitary excursions in the wilderness Nuttall got lost, and not returning, the party did not wait for him, but resumed their march, sending out some friendly Indians to look for him and conduct him upon his journey to rejoin the company. The Indians performed their duty faithfully. Looking upon him, however, as a great medicine man, they were afraid to approach him. They therefore surrounded him, and kept at a respectful distance. Nuttall was soon aware that he was watched by savages, and not knowing their character, whether friends or foes, he was in the greatest state of alarm. From all he had already experienced at their hands, he had the utmost horror of the Indians. Therefore hiding himself, and taking advantage of every ravine, every tree and bush, he succeeded in regaining the track of the caravan, which he followed for three days without food or sleep, when, to his infinite delight, he overtook it and was relieved from his anxieties.

On another occasion Nuttall was rambling in the vicinity of the camp, when a band of Indians, apparently hostile, made its appearance. The alarm was immediately given, with orders to arm and be ready for the expected attack; but Nuttall was not among them. A friend, uneasy about him, ran in search

* This delineation of Mr. Nuttall's person and character has been furnished to me by Prof. Carson, to whom, as well as to Dr. Pickering, Mr. Lea, and other friends, I owe many of the details herein mentioned.

of him in the direction he had taken. It was not long before he perceived the great naturalist, at some distance, quietly occupied in examining a plant. He hailed him, with signs to return quickly. "We are going to have a brush with the Indians," said he, "is your gun in good order?" Alas! the gun had been freely used to uproot plants, and was filled with gravel to the muzzle. Had Nuttall used it in this condition, it would inevitably have burst in his hands and killed or wounded him severely.

In crossing over the Rocky Mountains the caravan separated in two parties, each following a different route and having rendezvous at Fort Hall. One of the parties had the good fortune to meet with plenty of buffalo cows, upon which they freely feasted and became fat. The other, on the contrary, to which Nuttall belonged, suffered much from fatigue, and scarcely found anything to eat except a few lean grizzly bears. On arriving at Fort Hall, Nuttall had lost so much flesh that his old companions could scarcely recognize him; and upon one of them expressing his surprise at the great change in his appearance, he heaved a sigh of inanition, and retorted: "Yes, indeed, you would have been just as thin as myself, if, like me, you had lived for two weeks upon old Ephraim (grizzly bear), and on short allowance of that too!"

Mr. Dana, in his book "Two Years Before the Mast," relates an amusing anecdote of Nuttall, who was a passenger on board the same vessel. While opposite Cape Horn, and close to the land, his passion for flowers revived at once, and he entreated the captain to be put ashore, that he might make acquaintance with the vegetation of this dreary spot. The wind was then blowing furiously, and the vessel surrounded with icebergs and in danger of being wrecked. Still, Nuttall, undaunted by any circumstance, insisted upon being landed, even for a few hours. His request, of course, was sternly refused by the captain, to the great disappointment and displeasure of our naturalist, who could not conceive such an indifference for the cause of science in a seafaring man.

Nuttall was excessively economical in his habits and careless about his dress; none of his Philadelphia friends, I be-

lieve, ever knew where he resided, nor in what manner he lived. The profession of savant is not a very profitable one, yet with the few opportunities he had to advance his interest, he had succeeded, through the most strict saving, in laying aside a competency for his old age, even had he not inherited the estate of Nutgrove. He once travelled on foot to Westchester in his usual travelling dress, carrying his provisions with him, and a basket of minerals which he intended exchanging for Westchester specimens. Without stopping at any hotel, he visited the mineralogists of the place, and having accomplished his object, the gentleman with whom he had made exchanges, asked him where he would send the package, and what direction he would put on it? Nuttall answered simply to write Thomas Nuttall, and he would call himself for it. At this name, so well known by scientific men, the gentleman retorted, "Any relation, sir, to the great botanist?" "I believe, himself," said Nuttall. Upon this he was cordially invited to a more tempting dinner than that he was carrying in his basket.

At last the time appointed for the departure of Captain Wyeth's expedition was at hand, and Nuttall bade adieu to his Philadelphia friends. He was accompanied by Mr. John K. Townsend, a young naturalist who was sent out on the joint account of the Philosophical Society and of the Academy of Natural Sciences. The expedition was undertaken by the Columbia Fishing and Trading Company, for the purpose chiefly of establishing trading-posts beyond the Rocky Mountains and on the coast of the Pacific. Capt. Wyeth had collected at St. Louis and Independence a party of men to cross the continent, and this party Messrs. Nuttall and Townsend joined at St. Louis on the 24th of March, 1834. On the 29th following, they both started on foot from the capital of Missouri, arrived at Fulton on the 6th of April, and at Brownville on the 8th.

There they were joined by Capt. Wyeth, and embarked with him on a steamer for Independence, where the whole party had rendezvoused. "On the 28th of April," says Mr. Townsend, "at 10 o'clock in the morning, our caravan, consist-

ing of seventy men and two hundred and fifty horses, began its march. Capt. Wyeth and Milton Sublette took the lead, Mr. Nuttall and myself beside them; then the men in double file, each leading with a line two horses heavily laden; Capt. Thing (Wyeth's assistant) brought up the rear; then the band of missionaries, with their horned cattle, rode along the flanks, and they proceeded over

> 'Vast savannas, where the wandering eye,
> Unfixt, is in a verdant ocean lost,'

across the arid plains of the far West, beyond the steppes of the Rocky Mountains, down to the Oregon, and to the extended shores of the Pacific."

I shall not follow our bold adventurers in their long and perilous journey, so well described in Mr. Townsend's narrative.* They successively crossed interminable green plains and great sandy wastes, grassy glades and black hills, high mountains and delightful valleys, along refreshing streams; suffering from fatigue, thirst, and hunger; tormented by gnats, constantly alive to the danger of the short rattlesnake of the prairies, of the grizzly bear, that formidable inhabitant of the mountain, and withal to the arrow and tomahawk of the savage and treacherous Indian, always prowling about the white men's caravans to steal or murder. But what's all that, if our naturalists can gather the harvest of the cherished objects of their explorations? "To me," said Mr. Nuttall, "hardships and privations are cheaply purchased, if I may but roam over the wild domain of primeval Nature, and behold

> 'Another Flora there, of bolder hues,
> And richer sweets, beyond our garden's pride.'

How often did I realize the poet's buoyant hopes amidst my solitary rambles. My chief converse has been in the wilderness with the spontaneous productions of Nature; and the study of these objects and their contemplation have been to me a source of constant delight."

* Narrative of a Journey across the Rocky Mountains to the Columbia River, &c. Philadelphia, 1839.

On the 3d of September, they came in view of the noble Columbia River; they descended its course partly on foot, partly in canoes, and stepped on shore at Fort Vancouver, the end of their journey across the continent. Six months and three days had elapsed since they had left Philadelphia. Such was the first part of this adventurous journey. They remained at Fort Vancouver the rest of the autumn, still exploring the environs of the Fort, and revisiting the fertile Valley of the Walla-Walla; but, anxious to escape the wet and unpleasant winter of that region, and to visit other parts where the inclemency of the season could not interfere with the prosecution of their respective pursuits, they took passage on board a Boston brig, ready to sail for the Sandwich Islands. They put to sea towards the middle of December, and landed on the Island of Oahu, on the 5th of January, 1835.

Here, for the first time, Mr. Nuttall enjoyed the beauties of a tropical vegetation, "a climate that knows no change, but is that of a perpetual spring and summer." There he remained a couple of months, visiting the different islands of that happy group, and collecting plants and sea-shells. Thence separating from his companion, Mr. Townsend, he took passage on board a vessel sailing for the coast of California, where he landed early in the spring, to enjoy new emotions of pleasure. All again was new to him! He remained in California a great part of the spring and summer, actively engaged in making collections, and returned to the Sandwich Islands, where he embarked on a Boston vessel, to come back to the United States, round Cape Horn.

Mr. Nuttall arrived in Boston in the beginning of October, 1835. When he went to the counting-house of Messrs. Bryant & Sturges, the owners of the vessel which had brought him home, with the view to pay for his passage, these gentlemen courteously refused to receive the money of one who had been travelling, not for his own amusement, but for the benefit of mankind!

Upon his return to the United States, he again took up his abode in Philadelphia, working alternately upon his rich collections of plants, minerals, and land and sea shells. In the small room of the Academy, then corner of Twelfth and George

Streets, Mr. Nuttall and Dr. Pickering were always seen working together; one at his own collections, the other on the Schweinitz Herbarium. These two great naturalists lived in the most perfect harmony, both being enthusiastic lovers of natural science. They were met occasionally, walking together, on a fine day, visiting the different gardens and conservatories of the neighborhood. In these walks, Nuttall would freely relate the particulars of his life; he spoke of having expectations in England; that an uncle who had succeeded in his business, had assured him he would be his heir. He mentioned having set up with his own hands, the types of an edition of one of Priestley's works, and gave also an account of his first visit to Professor Barton, and of the beginning of his botanical studies, &c.

Conchology was then a new object of study to Mr. Nuttall. He took much interest in it, usually spending the daylight in the Academy building, without troubling himself about his meals. Dr. Pickering, after an hour's absence in the middle of the day, would sometimes find him stooping over one of the cases of shells, as unmoved as a statue, in the same place and position as when he left him.

In 1840, Mr. Nuttall published in the Transactions of the American Philosophical Society, a long and interesting memoir, entitled: "*Descriptions of new species and genera of plants in the natural order* COMPOSITÆ, *collected in a tour across the continent to the Pacific, a residence in Oregon, and a visit to the Sandwich Islands and California, in the years* 1834 *and* 1835." And soon after another paper, headed: "*Description and notices of new and rare plants of the natural orders* LOBELIACEÆ, CAMPANULACEÆ, VACCINIEÆ and ERICACEÆ, *collected in a journey across the Continent of North America, and during a visit to the Sandwich Islands and Upper California.*" Having then been induced to write an appendix to Michaux's Sylva, he entered upon this undertaking with his usual energy, and completed it in a very short time, but having been obliged abruptly to leave this country, the work could not be published under his auspices. The manuscript was placed in the hands of Mr. Dobson, who had been engaged to superintend its publication. At the death of this gentleman,

some of the letter-press having been found defective and rejected, the entire publication of that work was retarded for several years; it was at last completed in 1846 by the late Dr. Lambert, a protegé and pupil of Nuttall.

The preface appended to that work is a beautiful piece of elocution. In reading it, you feel carried along with him through all his adventurous journeys; you partake of his fatigues and dangers, of his feelings of awe in the midst of the wilderness, and of admiration at the sight of the luxuriant vegetation of the tropics; you enjoy his delight, amounting to ecstasy, whenever he discovers objects that have not met his eye before, and you shudder with him amidst the mountains of ice, which in an unusual array oppose his passage around Cape Horn, the dreary extremity of South America. At last, you see him landing again on the shores of the Atlantic, and in his transports of joy, he exclaims: "Once more I hail those delightful scenes of nature, with which I have been so long associated." Then, he closes his elegant peroration with this warm farewell to this country, "But the oft told tale approaches to its close, and I must bid adieu to the New World, its sylvan scenes, its mountains, wilds, and plains,—and henceforth, in the evening of my career, I return, almost an exile, to the land of my nativity!"

Poor Nuttall! Yes, indeed, he may well say "almost an exile, to the land of his nativity." He had left it thirty-four years past, and was returning almost a stranger to its people and customs. He was strongly attached to the United States. Here were almost all his associations; he had friends who were dear to him; and, wherever he went, whether in the valley or on the mountain, by the shores of the sea or the margin of the quiet stream, he felt surrounded by old acquaintances, his dearest flowers; or met, by chance, a new object for his admiration.

But an uncle, without family of his own, had bequeathed to him an estate, called Nutgrove, in the neighborhood of Liverpool, and he must go and take possession of it. The will was incumbered with a clause most distasteful to him, requiring him to reside at least nine months of the year in England for the remainder of his life. He hesitated, for a

considerable time, whether to accept the inheritance, with its restrictions; but consideration for his sisters and their families, induced him at last to go to England, and take the rural estate left to him. He returned only once to this country after this; and, as he could not be more than three months absent in the year, he took the three last months of 1847 and the three first of 1848, thus passing with us about five months of the inclement season, when the nature he loved so much was dead to him, only to revive when he was forced to turn his back upon her.

In this short visit, his usefulness at once revived. Finding himself at the Academy, among his old associations, with materials at hand, he at once set to work, and studied the plants brought by the late Dr. William Gamble, from the Rocky Mountains and Upper California; the descriptions of which were published in August, 1848, in the Journal of the Academy of Natural Sciences.

It does not appear that the bequest of the Nutgrove estate had placed Mr. Nuttall in a position of affluence. The estate was, it is said, incumbered with annuities, and burdened with a heavy income tax. He had, moreover, a numerous family of relatives to support. By his old American friends, who visited him at his English abode, he was found living in the fashion of a plain farmer, working on his grounds and nurseries among his men, like one of them, and eating at the same table with them. He used to say that it was difficult, in England, to enjoy the benefits of a moderate fortune, for the government took good care to exact the superfluous.

When, in April, 1854, Dr. Pickering visited Mr. Nuttall at Nutgrove, he perceived him, on entering his grounds, stooping on one knee, examining a growing plant. Nuttall, turning his head and recognizing his old friend, arose and came forward, saying—"How strange it seems to me to see you in this country!" He invited him in, and they spent several hours together, conversing about old acquaintances, walking through his conservatories, and looking over his collection of living Rhododendrons. Dr. Pickering saw him again some months after, and perceived a change that he could scarcely account for, namely,—that he who had been accustomed to

roam thousands of miles all over North America, in times when it was really dangerous to do so, should now attach importance to and speak emphatically of having derived great satisfaction of a single visit to Ireland, and further, should have never visited the continent of Europe, close at hand.

Mr. Nuttall spent the last seventeen years of his life on his estate of Nutgrove, employing his time in the culture of rare plants, and especially Rhododendrons, which his nephew, Mr. Thomas J. Booth, had brought with him from the mountainous districts of Assam and Bootan, in Eastern Asia, and the new species of which he has published, at different times, in British scientific periodicals. At last, after a long and laborious life, entirely devoted to science, the great explorer of American botany met with an accident which ultimately resulted in his death. In his eagerness to open a case of plants which he had just received from Mr. Booth, he unfortunately overstrained himself, and from the time of his injury he gradually sunk and died, on the 10th of September last (1859), at the age of seventy-three, leaving, I am told, his estate and collections to his nephew and pupil, Thomas J. Booth, like himself an ardent naturalist and daring explorer.

Through his love of study, firmness of mind and devotion to the natural sciences, Mr. Nuttall raised himself, from the condition of a mere artisan, to the exalted position of a highly scientific man. No other explorer of the botany of North America has, personally, made more discoveries; no writer on American plants, except perhaps Professor Asa Gray, has described more new genera and species. His name will live as long as our Flora remains an object of study, and will be perpetuated, among the cherished objects of his particular attention, in a beautiful genus of the order Rosaceæ, *Nuttallia cerasiformis*, which his friends and colleagues, Professors Torrey and Gray, have dedicated to him. Let this great naturalist be set up as an example to young men similarly disposed, and an evidence that steadiness in the pursuit of knowledge will have its reward, and may lead to eminence. Honor to the memory of him to whom science is so much indebted, who so long lived in our midst, respected and loved for his usefulness, his unaffected manners, and amiability in the social circle!

(Continued from page 296.)

as practicable. The first lever should be very strong and light, and for this purpose may be made of skeleton form, of considerable lateral dimensions, or rather *vertical*, the lever being in a horizontal position and acting vertically. The second lever and pulley are very delicate and slender.

The position of the pulley, as above arranged, enables me to place a dial over it, with an index attached to the projecting shaft of the pulley.

One solid plate of metal (brass) forms the support and union of all the parts sustaining the rods, levers, and pulley. The lower extremity of the *parallel rods* being held by springs, may not necessarily have a continuous metallic support from the other parts.

The second part of the apparatus does not require the nice mechanical precision of the first part; its purpose being merely to record the indications of the Thermometer.

The recording portion of the apparatus consists of a train of cylinders carrying a fillet of paper, the axes of the cylinders being parallel with the parallel wires which guide the registering point of the Thermometer.

One of these cylinders presents the surface of the paper to the registering point, which passes very near, but not in contact with it, the movements of the registering point being across the paper. A series of *levers* and *springs*, which cannot be well described without diagrams, gives the proper "feed" to the cylinders and paper. But as this part of the apparatus is susceptible of an endless variety of modifications, it is unnecessary to speak of it further.

Connected with the cylinders is a hammer, made with reference to the *width* of the fillet of paper. This hammer imparts the necessary force to the registering point to make a small hole in the paper fillet, and is, when not in action, held from contact with the registering point by means of a recoil spring, which spring is adjustable by means of a screw. The levers connected with the feed of the cylinders are operated by the back movement of the hammer.

The third part of the apparatus consists of a common ma-

rine clock, with jewelled movement, to secure its action in cold weather. In practice, it will be necessary to have clock movements constructed with special reference to the number of records it is desired to obtain. A common thirty-hour clock, in order to have the necessary power to move the *hammer*, requires to have each alternate pin removed from the wheel that actuates the hammer lever; the lever requires, also, to be modified so as to accommodate the change. This change, if quarter-hourly records be required, will make it necessary to re-wind the clock too often.

My apparatus has the striking part of a clock constructed to move both the time and striking trains, as the equivalent of the *striking part* of one clock; the whole service of the spring being turned upon the striking train—the time train being removed, its space being occupied by the necessary levers. A marine clock, with time movement only, imparts the *time* to the striking part, very much as in any ordinary clock, except that the shaft of the minute wheel has *four* projections instead of one, so that I can obtain records four times each hour. A peculiar arrangement, difficult of description, enables me to change the rates from quarter-hour to half-hour, or hour movements of the hammer.

In describing the Thermometer, I omitted to mention that the lower end of the central brass wire in the bundle of compensated rods, was furnished with an adjusting screw, by means of which the index and registering point may be adjusted to any desirable point.

My fillet of paper is $2\frac{3}{4}$ inches wide. This enables me to obtain a range of nearly 50° without shifting the position of the registering point. In a trial of one week I have not found any occasion to readjust the index and registering point. I have much difficulty, however, in the *scale* of my apparatus, and this arises from using a mercurial thermometer as a standard of comparison, the tube of which is probably unequal in its dimensions in various parts, and the scale not corrected to correspond. At first, I constructed my scale from temperatures —10° to +80°, about 164° on my dial. Subsequent comparisons show that between 30° and 40° of the

Mercurial Thermometer, 10 of the Mercurial Thermometer correspond to 9 of my dial. I have, therefore, no dependence on the mercurial instrument I have, especially as no ten degrees of the two instruments will agree, except the 10 on which a correction is made, although they agree over a long range at extremities.

In presenting this account of my apparatus, I *desire* that a knowledge of it may be made widely public, for the benefit of those scientific men who may appreciate it, and desire to use a similar apparatus constructed under their own supervision. The details of all the parts are susceptible of numerous modifications. I have not so much devoted my attention to the *best* arrangement of *all* the parts, but have confined my efforts more particularly to perfecting the *Thermometer* in that form which will make it most reliable and least susceptible of improvement. The *rods* are on the outside of the case which incloses the dial, registering apparatus, and clock. The apparatus is very sensitive. The rods move the index freely to $\frac{1}{4}$ degree, and the ticking of the clock attached imparts just enough vibration to overcome resistance to a very minute fraction of a degree. Indeed, on watching the index while a slight change of temperature occurs, the index may be seen to advance or recede with the tickings of the clock, almost creating the impression that they are only parts of one movement.

Yours, JAMES LEWIS.

Pending nomination, No. 397 was read.

Dr. Wm. Harris, from the committee appointed to procure a portrait of Judge Kane, reported it finished and in the hall of the Society, and presented the bill for painting, framing, &c., which was ordered to be paid.

And the Society adjourned.

Stated Meeting, April 6th, 1860.

Present, twenty-four members.

Dr. Wood, President, in the Chair.

Letters were read from the Smithsonian Institution, dated January 10, 1860, from the Geographical Society of Paris, Feb. 20, 1860, from the Boston Public Library, Feb. 21, 1860, from the Massachusetts Historical Society, March 13, 1860, acknowledging the receipt of publications of the Society.

The following donations for the Library were announced:—

Bulletin de la Soc. Géog. I, xviii, July—Dec. '59.—*From the Society.*

Monthly Notices R. Astron. Soc. Vol. xx, No. 4.—*From the Society.*

Proc. Bost. Soc. Nat. Hist. vii, signatures 13, 14.—*From the Society.*

Proc. Acad. Nat. Sci. Phila. 1860, sig. 4.—*From the Academy.*

Ann. Lyc. Nat. Hist. N. York, Vol. vii, Nos. 1–3.—*From the Lyceum.*

Amer. Jour. of Science, New Haven, March, 1860.—*From the Editors.*

Amer. Jour. of Med. Sci. April, 1860.—*From Blanchard & Lea.*

Med. News & Libr., Mar. & Apr., 1860.—*From Blanchard & Lea.*

Jour. of Franklin Inst. No. 411, March, 1860.—*From the Institute.*

History of the Religious Society of Friends, by S. M. Janney, in four Vols. Vol. 1, second edition, 480 pp. 8vo. Phila. 1860.—*From the Author.*

What may be Learned from a Tree, by Harland Coultas. Second edition, 200 pp. 8vo. Phila. 1860.—*From the Author.*

Ann. Address on the Events of the Year, before the Phil. Co. Medical Soc., Feb. 22, 1860, by Benjamin Horner Coates, M.D., 30 pp. 8vo. Phila. 1860.—*From the Author.*

Communication from the Director of the Mint to the Secretary of the Treasury, relative to a proposed Branch Mint at New York, 12 pp. 8vo. Phila. 1860.—*From the Board of Trade.*

Total Eclipse of July, 1860, 6 pp. 8vo. Washington, 1860.—*From the Nautical Almanac Office.*

Reflections upon the Temporary Star of 1572, by Alex. Wilcocks, M.D., 12 pp. 4to. Phila. 1840.—*From the Author.*

Obs. on the Genus Unio, by Isaac Lea, Vol. vii.—*From the Author.*

Extracts from Proc. A. N. S. Phil., by Isaac Lea, 24 pp. 8vo.—*From the Author.*

Polar Exploring Expedition. A Special Meeting of the Am. Geog.

and Stat. Soc., March 22, 30 pp. 8vo., with Map, New York, 1860.—*From W. P. Foulke.*

Paulding (J. K.)—Prof. Trego announced the death of a member of the Society, the Honorable James K. Paulding, April 4th, 1860, aged 81.

Dr. Emerson called the attention of the Society to a fact in optics, which seems to have been but little noticed. A very simple experiment illustrating the combined action of the mental and optical faculties concerned in vision. A person standing before a mirror, holding a picture before him, with its face also towards the mirror, will find the reflection of the hands or right and left sides of a picture reversed, the right hand appearing the left and the left the right. But this reversion does not extend to the person holding the picture, or others by his side, whose right and left sides are recognized only as right and left. This illustrates the effects of education of the eye, which having recognized through repeated observations the true relations of the two sides and hands, admits without hesitation the mental evidence, but refuses to accept any but optical evidence from the flat surface of the picture.

Dr. Leyburn, pursuant to appointment, read the following obituary notice of the Rev. J. Addison Alexander, a deceased member of the Society.

OBITUARY NOTICE OF JOSEPH ADDISON ALEXANDER, D.D.

BY JOHN LEYBURN, D.D.

Joseph Addison Alexander, was the third son of the late Archibald Alexander, D.D., of Princeton, N. J., and was born in the city of Philadelphia, April 24th, 1809. On his maternal side he was the grandson of James Waddell, the celebrated blind preacher of Virginia, immortalized by Wirt in the *British Spy*. His father having removed from Philadelphia to Princeton, young Alexander became a student of the College of New Jersey, where he graduated in 1826, with valedictorian honors, a great achievement for a youth of seven-

teen. He then became an associate of the principal of the Edgehill School at Princeton, where he remained until 1830, when, at the early age of twenty-one, he was chosen adjunct professor of languages in the College. Here he remained till 1833, when he resigned his post, which he had filled with signal success, and sailed for Europe, where he spent a year in prosecuting his studies, chiefly at Halle and Berlin. On his return home he completed his theological course, as he had begun it, with his eminent father. In the year 1838 he was licensed to preach the Gospel, and in 1839 was ordained to the full work of the ministry. But several years before his licensure, he began to assist in the instructions of the Theological Seminary at Princeton, and in 1839 was elected Professor of Oriental and Biblical Literature in that institution, by the General Assembly of the Presbyterian Church. In 1851 he was transferred by the Assembly to the department of Biblical and Ecclesiastical History; and by the Assembly of 1859, his professorship was entitled that of Hellenistic and New Testament Literature. It was while occupying this post that death found him, and closed his mortal career.

This cursory enumeration of the official positions which he filled with eminent, and without exaggeration it may be said, unparalleled ability, though indicative of the high estimation in which he was held, gives, however, a wholly inadequate idea of a man who, beyond all question, was one of the most extraordinary this country has ever produced. From his childhood he exhibited a remarkable precocity. He scarcely needed schools or teachers, such was his passion for knowledge. His facility in the acquisition of languages seemed almost to approach intuition. When but a boy of twelve years, finding an Arabic grammar in his father's library, he commenced studying it, and at fourteen had so mastered the language that he read the Koran through in the original,—a linguistic feat in all probability which has no parallel. From Arabic he turned his attention to Persiac, after which he acquired Hebrew, Syriac, and Chaldee, and this before he had fairly reached the age of manhood. Later he familiarized himself with Sanscrit. As for Greek and Latin, they were almost

vernaeular to him. Of the modern languages he had mastered Freneh, German, Italian, Spanish, Duteh, Danish, and Coptie, and how many others, is not certainly known; but after having got so many, a new aequisition of a eognate tongue was to him a matter of a few weeks or days. One who knew him as well perhaps as any living person, informs the writer of this that, as a matter of literary recreation, Mr. Alexander was every year exploring some new field in this department of learning, and that it would be "easier to enumerate the languages he had *not* studied, than those with whieh he was familiar."

But, as his eminent colleague the Rev. Dr. Hodge says of him, notwithstanding these wonderful attainments, "his power of acquiring languages was the very smallest of his gifts." His intellectual power was as general as it was great. He was great in everything he understood, and great in all his faculties. "The greatest man," says Dr. Hodge, "whom I have ever known; all whose powers and attainments were consecrated to the eause of truth and of Christ." A high eompliment, truly, eoming as it does from one who himself occupies the front rank amongst the seholars of the age.

As an author he is best known by his elaborate eommentaries on various portions of the Seriptures, whieh readily gained for him a high reputation among the learned of the Old World, as well as of the New. He was a profound biblieal critie. The vast stores of Germany in this department were perfectly at his eommand, as well as every other repository of the labors of his predeeessors or eontemporaries. Indeed, the only exception we have ever heard mentioned to his eommentaries, is that they are too learned,—that there is an exuberanee whieh amounts to prodigality. His store of antiquarian, historie, and biblical knowledge, was wonderful.

What was a most valuable aeeompaniment of his passion for aequisition in the fields of learning, was his remarkable memory. The tenaeity of this faculty with him, too, extended to everything,—not merely to leading ideas or historieal facts, but to words and names,—and that even where there seemed to be no special eall for its exercise. As an instance

in point, one of his colleagues mentions that, at the beginning of the seminary term, when forty or fifty new students have usually matriculated, and without regard to the order of their names, it has not unfrequently happened that the next day, when the names of these students would be needed, he would take his pen and write down the entire list in the order of their matriculation, giving even the middle letter in each name, and the classes they were to enter, purely from memory.

His investigations were always thorough and exhausting. Every topic was examined with minuteness, even to such remote circumstances as would escape ordinary minds. In communicating his knowledge, too, he was in like manner remarkable. His command of language has seldom been surpassed. He always seemed to have at his tongue's end the most appropriate words to express his ideas, and it was a pleasure to sit and listen even to the cadence and flow of his copious vocabulary.

As a writer of "facetiæ," he possessed a wonderful power. The Philadelphia Monthly Magazine, edited in 1827–8, by Dr. J. C. Snowden, and published by Dobson, contains many of his earlier pieces, and the Princeton Magazine is full of them. His perception of the ludicrous was acutely instinctive, and his wit and humor choice and exhaustless. As a reviewer he was well known as occupying the very front rank. The Biblical Repertory and Princeton Review, was indebted to him for a large portion of its most attractive and telling articles. These he produced apparently without effort. With the greatest ease he could "steer from grave to gay," now writing a playful slashing criticism upon some unfortunate author, and now dealing with some ponderous question of philology. Some of these articles are among the most brilliant and scathing in the whole range of periodical literature.

Of his poetical talent the public knew less than of any other. What he published was anonymous, and when a piece would occasionally be traced to him, as in the case of "The Doomed Man," it seemed to annoy him.

To Dr. Alexander's powers as a preacher, thousands can

bear witness. When occupying one of the Philadelphia pulpits for a year or more, he drew crowds, which filled not only the church but the vestibule. In his manner there was nothing of what are considered the graces of oratory. He usually read his sermons closely, without action, and in a rapid monotonous tone; but the copiousness of thought, the affluence of language, and the richness and vividness of his imagination, charmed every one. It was as if one were listening to a Macaulay, discoursing from the pulpit on the sublimest of themes.

Almost the entire life of Dr. Alexander was occupied in study. He was a recluse in his habits, and characterized by remarkable diffidence. This latter quality made him shrink from society, and left the impression very generally that he was deficient in the social element. But those who had access to him in private, well know that there was no more genial companion. He was full of the most entertaining conversation, and much as he kept himself aloof from the world, seemed always thoroughly familiar with current events, and with the actors in them.

In his method of writing he was at times almost whimsical, or at any rate altogether unique. He seemed to weary with following any one form in preparing his manuscripts, and would write on sheets of paper of various shapes and dimensions, and with the lines taking every conceivable direction. I remember once to have seen specimens of his manuscripts, which had the lines running around the large sheet, so as to form a complete circle.

In these cursory statements we are aware that but a most inadequate view has been given of this extraordinary man. Volumes rather than a short obituary paper, would be required to portray, in anything like their amplitude and proper proportions, his gifts and attainments. His death at the age of little over fifty, when only yet in the midst of his prime, is a loss to American learning, and especially to biblical literature, which can with difficulty, if ever, be supplied. His sedentary habits undoubtedly undermined his constitution and shortened his life. For the last two or three years he had lost his former

full and almost plethoric appearance, and had begun to wear the aspect of premature old age. Some months before his death, he was attacked with bleeding at his lungs; this, however, was but one of the effects of another disease, which had been for some time prostrating and wearing down his health. The real destroyer of his life was that exhausting and terrible complaint, *diabetes*. From this he had suffered, unknown even to his friends. His end at last came, with but little indication that it was just at hand, and in a few hours after an attack which rendered him insensible he breathed his last. But to him the event was evidently not unanticipated. His mind had been more than usually engaged in devotion, and it is worthy of remark, as illustrative of the simplicity of his piety, that he occupied himself during much of his time after he was disabled from severe study, in committing hymns to memory. But instead of chanting in Greek the ancient hymn of Clemens Alexandrinus, or some other such time-honored lyric, which a scholar like himself might have been supposed to prefer, his favorite hymn was that so often sung in the prayer-meetings of the humblest Christians:

> "Just as I am, without one plea,
> But that thy blood was shed for me," &c.

His splendid intellect and his vast resources were all brought into subjection to his Christian faith. He had no fellowship with that pride of learning which exalts itself even above the revelations of Divine wisdom. He was as lowly in his estimation of himself, as he was exalted in the opinions of his fellow-men, and especially did he regard himself as incompetent to sit in judgment upon his Maker, and decide, as too many attempt to do, what he should and what he should not have revealed.

On the 28th of January, 1860, Joseph Addison Alexander died, and was laid beside his eminent father and brother, and a galaxy of the illustrious dead, in the graveyard at Princeton.

Pending nomination, No. 397 was read.

Mr. Foulke, on behalf of the Committee on the Library,

read a report from the Committee on the Condition of the Library, its rearrangement, and the preparation of a new Catalogue, offering the following resolutions, which, on motion, were adopted:—

Resolved: That the Treasurer is hereby directed to refund to the Librarian of the Society, the sum of four hundred and sixty-six dollars and fifteen cents, paid by the Librarian for assistance in rearranging and cataloguing its library. *Resolved:* That the Librarian is hereby authorized to make in conjunction with the Committee on the Library, the arrangements necessary for printing a catalogue of the books in the Library of the Society.

Dr. Leidy presented a list of plaster casts of natural history belonging to the Society, and moved that the casts therein mentioned be deposited with the Academy of Natural Sciences, upon the same conditions as a deposit formerly made by the Society with the Academy, a complete list of said casts to be presented at a future meeting, which was agreed to.

A communication was read from Prof. A. D. Bache, requesting the signatures of the officers of the Society to a memorial to Congress, in relation to observations proposed to be made of the eclipse of the sun on the 18th of July next, recommending the sanction of Congress to the making of observations by the officers of the United States Coast Survey. On motion of Prof. Cresson, the officers of the Society were authorized to affix their signatures to the said memorial.

On motion of Prof. Kendall, the St. Louis Academy of Science and the American Oriental Society of New Haven were authorized to receive the Transactions of the Society.

And the Society adjourned.

Stated Meeting, April 20, 1860.

Present, nineteen members.

Dr. Franklin Bache in the Chair.

Dr. F. W. Lewis, a newly-elected member, was presented to the President by Dr. Le Conte.

Letters were received from the Committee of the Miners and Metallurgists, assembled at Vienna, per Charles F. Loosey, New York, Nov. 15, 1859, and from the Prince Jablonowski Society, dated Leipzig, Nov. 20, 1859, transmitting donations for the library.

The following donations for the library were announced:—

Bericht über die Erste allg. Versammlung von Berg-und-hüttenmännern zu Wien, 10 zu 15 May, 1858.—*From the Association.*

Mittheilungen der K. K. Geographische Gesellschaft, 1859, heft 2.—*From the Society.*

Jahrbuch der K. K. Geologische Reichsanstalt. 1859. No. 2.—*From the Institute.*

Ansprache, . . . 1st decen. K. K. Geol. R. von W. Heidinger.—*From the Institute.*

Die fossilen Mollusken des Tertiär-beckens von Wien, von Dr. Moritz Hörnes, 2 B. Bivalves, 4°. (Extract.)—*From the Author.*

Ueber des Marsilius Ficinus Werk: de Vita Studiosorum, von Dr. W. R. Weitenweber. (Extract.)—*From the Author.*

Denkschrift über die Gebrüder J. Swatopluk und C. Boriwoj Presl. von D. W. R. Weitenweber. (Extract.)—*From the Author.*

Die Grundzüge der Aristotelischen Psychologie, von W. F. Volkman.—*From the Author.*

Leibnitz und Comenius, von Dr. F. B. Kvet. (Extract from the Abhand. der K. Böhm. Gesell. der Wiss. 4°.)—*From the Author.*

Correspondenzblatt des Naturforscherschenden Vereins zu Riga, 10th J.—*From the Union.*

Preisschriften. Fürstl. Jablonowski'schen Gesell. vii, H. Wiskeman, Die Antiche Landwirthschaft und das Thünensche Gesetz, &c., Leipzig, 1859.—*From the Society.*

Abhand. Math. Phys. C. der K. Bay, A. W. 8th vol. 2d pt.—*From the Academy.*

Almanach der K. Bayerischen, Academie der Wissenschaften, fur 1859.—*From the Academy.*

Gelehrte Anzeigen, Nos. 47 and 48.—*From the Academy.*

Untersuchungen über die Lichtstärke der Planeten, &c. Aus den "Monumenta Sæcularia" der K. B. A. W. 2 C. von Ludwig Seidel. München, 1859.—*From the Academy.*

Erinnerung an Mitglieder der Academie von Dr. Von Martius.—*From the Academy.*

Journal of the Franklin Institute, No. 412. April, 1860.—*From the Institute.*

Buffalo Young Men's Association, 24th An. Rep. 1860.—*From the Association.*

Geological distribution of Gold, by P. Nisser. Melbourne. 1859. 12°.—*From the Author.*

History of Ink, by J. Davids & Co. New York, 1860.—*From the Author.*

Lithographic illustrations of a new method of laying an Atlantic Cable. By Wm. H. Horstman.—*From the Author.*

Astronomical Journal. Cambridge. No. 132.—*From the Ed.*

African Repository. April, 1860. No. 4. Wash.—*From A. C. S.*

Catalogue of the Pennsylvania State Library. 425 pp. 8vo. By W. De Witt.—*From B. A. Schaffer.*

Professor Henry addressed the Society upon the theory of storms and atmospherical electricity, which elicited remarks from Judge Carleton and Dr. Emerson (to be printed in the next number).

Pending nomination, No. 397 was read.

Mr. Fraley took the chair, and on motion of Dr. Franklin Bache the following resolutions were adopted:

Resolved, That the President be requested, as representative of this Society, to communicate, so far as opportunity may permit, with the scientific and literary institutions abroad, with our foreign members, and with those persons that have been enrolled on our list of correspondents.

Resolved, That the Secretary be instructed to furnish to the President the necessary documents, duly authenticated, to carry into effect the foregoing resolution.

And the Society adjourned.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. VII. MAY—DECEMBER, 1860. No. 64.

Stated Meeting, May 4, 1860.

Present, fifteen members.

Judge SHARSWOOD, Vice-President, in the Chair.

A letter was read from the Scientific Association at Riga, dated October 26, 1857, transmitting a copy of its proceedings.

The following donations for the Library were announced:—

Monthly Notices of the Royal Astronomical Soc., Vol. XX, March 9.
Quarterly Journal Chemical Soc., No. XLVIII. London.
Journal Geol. Soc. Dublin, Vol. I—VIII. Vol. II wanting.
Proceedings Acad. Nat. Sciences. Philadelphia.
Medical News and Library, No. 209, May, 1860.—*From the publishers.*
Proc. Am. Ass. Adv. of Sci., 13th meeting at Springfield, Aug., 1859.
Proceedings Mass. Hist. Soc., 1859, '60. Boston, 8vo., 460 pages.
Cat. of Lib. Mass. H. S., Vol. II, M—Z. Boston, 1860, 650 pages.
Astronomical Journal, No. 113 (VI, No. 13). Cambridge, Mass.
Evangelical Repository, May, 1860, XVIII, No. 12.—*From Mr. Young.*

Mr. Lesley invited the attention of the members to the occurrence on both sides of the Atlantic, in Ireland and in Pennsylvania, and at the same geological horizon, of certain

beds of copper slates. In volume VIII of the Journal of the Dublin Geological Society, page 86, the gray copper ores, which characterize the red slates at the base of the so-called Carboniferous formation in the North and South of Ireland, are said to lie two thousand six hundred and forty feet below the base of the carboniferous limestone. Whether these rocks be Devonian or Carboniferous has been discussed by Mr. Jukes and Dr. Griffith, and decided by the latter, with the concurrence of Prof. Haughton and other British geologists, in favor of their classification as Carboniferous, on the ground of their containing fossils of that type.

It is remarkable that, along the base of the Alleghany Mountains, where our Pennsylvanian sub-carboniferous formations X and XI, so immensely thick at Pottsville, have thinned away to a few hundred feet,—and also in northeastern Pennsylvania, where the three formations IX, X, XI, are all together reduced to a thickness of not much more than two thousand feet, bringing the undeniably Devonian formation VIII, up to within that distance of the coal, there occurs a copper-ore slate horizon a few feet thick, which will exactly correspond in position to the copper-slates of Ireland.

The Society was then adjourned.

Stated Meeting, May 18, 1860.

Present, fifteen members.

Dr. Wood, President, in the Chair.

The following donations for the Library were announced :—

Annales des Mines, Vol. XV, 3d part, and Vol. XVI, 4th pt. of 1859.

Intorno alla influenza dell 'Elettrico nelle formazione della Granuola, &c. An 8vo. pamphlet memoir of Prof. Zantedeschi.

American Journal of Science for May, 1860.

Journal of the Franklin Institute for May, 1860.

Centennial Anniversary of the Foundation of the Germantown Academy, 1860. 8vo. pamphlet, 58 pages. Philadelphia.

The Motion of Fluids and Solids relative to the Earth's Surface; comprising Applications to the Winds and the Currents of the Ocean. By W. Ferrel. 8vo. pamphlet, 72 pages. New York. Taken from the 1st and 2d vol. of the Mathematical Monthly.

Dr. Franklin Bache announced the decease of Judge Thomas Sergeant, a member of the Society, who died on the 5th of May, in the 79th year of his age; and, on motion, E. Spencer Miller, Esq., was appointed to prepare an obituary notice of the deceased.

Mr. Dubois offered, for the inspection of the Society, a specimen of the Washoe ore, which is now attracting so much attention; with a report of its content in silver and gold, as just ascertained by Mr. Eckfeldt.

The ore is a galena, interspersed with pyrites and siliceous matter, and, in general appearance, altogether different from the forms of galena which we are accustomed to see. Nor would its physical characters lead any one to suspect that it could be so rich in the precious metals. The specimen is from the Comstock vein; and it may be stated (although probably known to the members present) that the centre of these mining operations is about three hundred and thirty miles in a north-easterly direction from San Francisco, within the line of the territory of Utah, in a country destitute of vegetation, and very scantily supplied with water.

From a careful assay, the specimen yields to the pound avoirdupois, *silver* to the amount of $2 35, and *gold* to the amount of 26 cents; altogether $2 61 per pound, or, in the usual language of valuation, five thousand two hundred and twenty dollars to the ton. A considerable quantity of this silver has already been sent to the Mint for coinage.

Dr. Wood, the President of the Society, delivered, in conformity with the laws of the Society, the following discourse:—

Among the regulations of the Society is one directing that "the President shall, at some time within the year, deliver to the Society a discourse on some literary or scientific subject, accompanied by such suggestions with regard to the affairs of the Society as he shall judge proper."

In the novelty of my position last year, I overlooked the exact purport of this law; and I must now offer an apology for the apparent neglect. My object in addressing you, on this occasion, is to fulfil the duty for the present year.

Two things are required by the regulation; one, a discourse on some literary or scientific subject; the other, suggestions on the affairs of the Society. I shall follow the order here laid down. As the length of the communication is left to the discretion of the President, I shall study to make it brief; so that, if it have no other merit, it may at least lay claim to that of wasting but little of your time and attention.

1. There is a point in philosophy which, I think, deserves more consideration than it ordinarily receives: I allude to the evil of too hasty generalization; of leaping to general conclusions inconsiderately from one or a few experiments or observations. This habit has, in my opinion, more than any other one cause, since the general acceptance of the inductive system of philosophy, contributed to the disturbance of admitted truth, and to the introduction of crude and unsound hypotheses, incapable of standing the test of time, yet productive, while they lasted, of no little practical mischief. I will cite a few examples.

A fact in geology is observed which, at first sight, seems to be in conflict with the Mosaic account of creation; and the inference is hastily drawn that we must surrender our faith in Scripture. Further observation reconciles the seeming discrepancies; but, in the meantime, much evil has been done by unnecessarily disturbing settled modes of thought, and, to some extent, even the existing relations of society.

Under certain experimental arrangements, living organized beings have been apparently produced out of inorganic matter, through the influence of electricity; and the conclusion is inconsiderately arrived at, that the general opinion of science as to the necessary propagation of vegetables and animals from pre-existing germs is unsound. Men are thrown into confusion as to their own origin and responsibilities, which interferes materially with their mental health, if it produce no more serious consequences. Subsequent observation shows that all this disturbance is baseless, by proving the experiment not to have been conducted with due care.

Under what have been called Mesmeric influences, which I believe to be nothing more nor less than means of producing a certain degree of irregular mental action, a curious morbid condition of the system

sometimes takes place, accompanied with unusual and seemingly wonderful phenomena; and many minds, not content with the simple facts observed, have pushed them into absurdities of an exciting character, which, in their practical operation, have led to great evil, the corruption of morals, the peopling of Insane Asylums, and sometimes even to suicide. A closer scrutiny limits the observed wonders within the ordinary recognized course of nature; and a better philosophical habit of thought would have obviated all the mischief.

It was found, upon feeding dogs exclusively on gelatin, that life could not be supported by this principle; and the inference was drawn that gelatin is not nutritious, and that all our notions relative to the nutritive properties of calf's-foot jelly, and the usefulness of soup societies, were based upon a great error of fact. Further experiments have shown that there is scarcely a single proximate organic principle which is capable of maintaining life, when used exclusively as food; and that it is by the combination of such principles that nutrition is effected. The same remark applies to all those hasty conclusions, which, from the result of one or a few experiments, would exclude from the category of nutritive food, many other substances which have always formed a part of the habitual diet of man.

It is well known that many chemists, founding their opinions upon similar partial observations, maintain that starch and other analogous substances do not nourish the system, but are useful simply by generating heat, through their oxidation or combustion in the body. The necessary conclusion is, that all physicians have labored under an egregious error, when they have used starch in the form of barley-water, rice-water, arrow-root, tapioca, sago, &c., for the support of the sick and feeble, and must surrender the experience of their professional lives and that of ages before them, to these presumed results of scientific induction. But they who reason thus do not sufficiently consider that, in certain hot climates, where the habitual temperature is often above that of the human body, and where the great struggle is to keep cool enough, millions upon millions of people live mainly on rice or sago, the former of which consists chiefly of starch, and the latter is pure starch. It is inconceivable that the prominent article of diet of such numbers, persons too in good health, and often of great powers of enduring fatigue, should consist of a substance having no nutritive power, and fitted only for generating animal heat, which, under the circumstances, is not needed, and is, indeed, often in excess.

These are a few of the almost numberless instances that might be adduced, illustrative of an habitual departure from sound principles of induction in the search after truth; but they are sufficient to show the great evil of this error, not only in relation to opinion, but in its effects upon the well-being of mankind.

We are peculiarly prone to it in this country, perhaps in consequence of the habit we have acquired, mentally as well as physically, of hastening onward impatiently to our ends, and, consequently, of recklessly overleaping or pushing aside considerations, which are nevertheless, in general, essential to a safe and satisfactory issue. It is, therefore, desirable to raise a conservative voice against this over-eagerness, and strive as much as may be to restrain it within safe limits.

There are three prominent modes in which partial or insufficient experiment or observation may lead into error.

In the first place, the fact, though in itself true, may not have been sufficiently studied in its various relations, or sufficiently compared with other known facts, which might invalidate the conclusions, hastily drawn from it when viewed isolatedly. Of this we have an example in the inference already referred to, as to the non-nutritive and heat-generating qualities of starch, employed as an article of diet; the attention of the observer having been confined to the results of a few partial experiments, and quite turned away from that grand experiment in the course of constant performance by millions of our race.

Secondly, the seeming fact may prove, on close investigation, not to be a fact at all, but a misunderstood result of inaccurate experiment; as in the production of organized beings through electric influence, out of inorganic matter; the truth being that sufficient care had not been taken to exclude living germs from the field of experiment.

Thirdly, the observed fact may lead to erroneous conclusions from want of attention to that general principle in nature, through which all objects of human thought or notice, of whatever kind, which may be associated together by any relation whatever, have a tendency to an irregular instead of equable distribution, clustering more or less at one time or place, and deficient in another; so that, when objects are diffused with perfect equability, they are known at once, as a general rule, to owe this condition to art. An ignorance or forgetfulness of this great principle has been the source of innumerable fallacies, often highly injurious in their influence. Such fallacies are

especially abundant in the practice of medicine, and are among the strongest supports of all kinds of quackery. I will adduce a single example. Scarlet fever may be a very mild and harmless, or a terribly malignant disease. It often happens, without any discoverable direct cause, that the milder cases cluster; great numbers occurring successively or simultaneously under the notice of a particular practitioner, perhaps without the presence of a single dangerous case among them. No matter what may be the remedy employed, whether good or good for nothing, they all terminate favorably. They would do so, if left entirely to themselves. Suppose, under these circumstances, the practitioner be an ignorant quack; he will obviously get the credit with the community, ignorant of the principle to which we are now referring, of possessing remarkable skill in the treatment of scarlet fever; and he himself, if equally ignorant, will acquire great confidence in the remedy he may have employed. The evil is that, in consequence of this confidence, born of an error in practical philosophy, the quack and his remedy are subsequently relied on in cases of a dangerous character, and requiring great skill; and it is easy to understand how much mischief may ensue.

A glance at the subject I have thus introduced to the notice of the Society, is sufficient to show its great extent and importance. A volume might easily be filled with illustration and commentary. But I content myself with the slight sketch given, fearing that even this may have been tedious to those, quite as conversant as myself with the matters referred to.

2. It remains, in order to fulfil my whole duty on this occasion, that I should make such suggestions as occur to me, with regard to the affairs of the Society.

Under this head I have little to say. In looking over the Transactions of the past year, and comparing them with those of preceding years, I find good reason for encouragement. Should an equal advance be maintained in the future, it will not be long before the Society will be able to boast, that it is doing all that can be reasonably expected of it. In the Proceedings, too, it has by no means been idle. The laws have been revised, modified, and newly printed; some effete regulations having been abolished, and new ones introduced, which it is hoped may work advantageously for the interests of science. Complete catalogues of members, with information as to the period of election and decease, residence, &c., have been prepared, and printed in a style conformable with that of the laws and regulations.

For the future I have only to suggest, a livelier zeal on the part of individual members in general; an encouraging voice from the older to the younger and more enterprising; an increase of our working men by the adoption into the Society of as many as show a strong disposition and ability to labor effectually in any one of the great departments of learning and science; and, lastly, the offering of pecuniary aid, in limited measure, to meritorious investigation, when such aid may be necessary, and can be advantageously applied. Another object worthy of attention, which should, indeed, never be lost from view, is the providing of fire-proof accommodation, whether in this or another building, for our invaluable library.

Lastly, I would refer briefly to a matter which concerns myself as your presiding officer. At the stated meeting, on the 16th of December last, upon the motion of the Chairman of the Committee on the sale of the Hall, a resolution was adopted requesting the President to prepare, and cause to be presented to Congress, a memorial in relation to the Hall, requesting the passage of a law to carry into effect the agreement for its purchase, made by the government. In compliance with this resolution, and in conjunction with the Chairman of the Committee referred to, I have prepared memorials to the two houses of Congress; but it has been considered most prudent, under present circumstances, to postpone their presentation; as there is reason to hope that steps may ere long be taken, which may render any measure of this kind unnecessary.

Most of the Society are aware that I have in contemplation a voyage to Europe, and that I may not meet them again for a year or more. Indeed, I have to thank you for your kindness in supplying me with a document, which, by recognizing me as your accredited representative abroad, will, I hope, in a considerable degree, facilitate the attainment of some of the ends for which I visit Europe. In taking my leave of you, gentlemen, I wish to assure you, that I shall continue to have the interests of the Society at heart, and, should opportunities offer during my absence, shall most gladly avail myself of them for the furtherance of these interests.

May 18th, 1860.

Judge Carleton made a communication on the subject of Free Agency, or Liberty and Necessity; referring to the opinions of Locke, Edwards, Sir William Hamilton, and other metaphysicians, and expressing his conviction of the entire simplicity and intelligibility of this subject of so many con-

troversies, seeing that *all* human science must consist of facts, or assemblages of facts, perceived by means of the senses; and that, therefore, metaphysics must rest as much on perceptible facts as does any of the so-called natural sciences. He promised to pursue the subject at a future meeting.

The minutes of the last meeting of the Board of Officers and Council were read, and, in accordance with a recommendation therein, the Dublin Geological Society, the London Philological Society, and the Liège Academy of Sciences, were ordered to be entered on the list of Corresponding Societies, and a copy of the New Series of the Transactions to be given to the first-named.

Pending nomination No. 397, and new nominations, from 398 to No. 415, were read.

A bill was presented for the painting of a portrait of Dr. N. Chapman by Waugh, after Sully, amounting to $125, and was ordered to be paid,

And the Society adjourned.

Stated Meeting, June 15, 1860.

Present, seven members.

Judge SHARSWOOD, Vice-President, in the Chair.

Letters, announcing donations to the Library, were read from the Academy at Vienna, dated July 7 and December 17; the Academy at Stockholm, dated November 25; and the Academy at Amsterdam, dated November 30, 1859.

Letters, acknowledging the receipt of donations from this Society, were read from the London Linnean Society, dated June 1, 1859; from the Historical Society of Pennsylvania, dated Philadelphia, May 29; from the Royal Library at Berlin, dated February 29; from the Natural History Society at Bonn, dated February 1; from the Imperial Academy at Vienna, dated February 24; and from Prof. Von Leonhard, of Heidelberg, dated February 26, 1860.

The following donations for the Library were announced:

Sitzungsberichte der K. K. Akademie der Wissenschaften. Wien. *Math. Naturwissenschaftliche Classe:* XXXIII Band, Nos. 27, 28, 29. XXXIV, 1, 2, 3, 4, 5, 6. XXXV, 7, 8, 9, 10, 11, 12. XXXVI, 13, 14, 15, 16. XXXVII, 17, 18, 19, 20. Register zu den Banden XXI bis XXX.—*Phil. Hist. Classe:* XXIX Band, Nos. 9 and 10 in one. XXX, No. 1. XXXI, 4, 5, 6. XXXII, 7. Register zu den Banden XXI bis XXX.

Almanach für 1859.

Verhandlungen des Naturhistorischen Vereines des Preussischen Rheinlande und Westphalens zu Bonn. xvi Jahr. 1st, 2d, 3d, and 4th heften, 1859.

Verhandelingen der K. Akad. van Wettenschappen. Letterkunde. I Deel, 4to. 1858, Amsterdam. VII Deel, 4to. 1859.

Verslagen en Mededeelingen, 8vo. IV Deel, Stuk 1, 2, 3.
" " Natuurkunde, 8vo. VIII " one vol. 1858.
" " " " IX " Stuk 1, 2, 3. 1859.

Jaarboek. 1858.

Handlingar Kong. Svenska Vetenskaps Ak. Vol. II, part i. 1857. 4to.

Ofversigt..... Förhandlengar, XV year. 1858. 8vo.

Berättelse..... Fysik, for year 1853, by E. Edlund..... Insekteras, Myriopodernas, Arachnidernas. Naturalhistoria, 1855–1856. C. H. Boheman.

Frigate Eugenia, Voyage. Zoologie, III, 4to. Marked 6 on back.

Proceedings of the Royal Geograph. Society of London, IV, 1.

Transactions of the Linnean Society, XXII. Parts iii, iv. 4to. Journal of the Proceedings of the same. Zoology—II, Nos. 7, 8; III, 9, 10, 11, 12; IV, 13, 14, 15. Botany—II, 7, 8; III, 9, 10, 11, 12; IV, 13, 14, 15. Supplement, Nos. 1 and 2. President Bell's Address, 2 copies. List of members, 2 copies.

Memoirs de l'Acad. Impériale de Dijon. 2d series, 7th vol. 1858'9.

Monthly Notices of the Royal Astronom. Society, No. 6. 1860.

Proceedings of the American Antiquarian Society. 1860.

Catalogue of the Library, Massachusetts Hist. Society, vol. I. A—L.

Proceedings of the Boston Society Nat. Hist., vol. VII, Nos. 15, 16.

Annual Report (42d) of the Trustees, New York State Library.

Supplement to U. S. Military Acad. Lib. Catalogue. N. Y., 1860.

Proceedings and Debates of the 3d National Quarantine and Sanitary Convention, held in New York, April, 1859, 8vo. bd. 700 pp.

Proceedings of the Acad. Nat. Sciences, Phila., 1860. Sigs. 6, 7, 8.

Journal of the Franklin Institute. June, 1860.

Medical News and Library. June, 1860.—*From the publishers.*
Ann. Report (27th) Philada. Board of Trade (170 pp. bound), 1860.
Rep. Sup. Com. Schools of Pennsylvania (bound, 300 pp.), 1859.
Sabrie's Book Circular, Nos. 6, 8. 1860.
Blanchard & Lea's Book Circular. 1860.
African Repository. May, 1860.
On Numerical Relations existing between the Equivalent Numbers of Elementary Bodies, by M. Carey Lea, part 2. From the Am. J. of Sci. and A. XXIX. May, 1860.—*From the author.*
Pacific Railroad Reports, Vol. XI, House of Representatives. 1859.
Pacific Railroad Reports, Vol. XI, Senate. Washington. 4to.
Astronomical Journal. Cambridge, No. 134.—*From the editor.*
R. Isti. Lomb. List of members, &c., 4to. 4 pages.
On the Alloys of Copper and Zinc, by Frans. H. Storer (from the Mem. of Am. Acad. Nat. Sciences, viii), 4to. 56 pp. pamph.

Dr. Bache announced the decease, on the 5th of June last, of Samuel B. Ingham, a member of this Society, in the 80th year of his age; and Judge Sharswood was requested to prepare an obituary notice of the deceased.

Dr. Bache announced also positive intelligence of the decease of Mr. H. S. Tanner, a member of this Society, having taken place some two or three years ago.

Mr. Lesley described a self-registering combined thermometer and barometer, made and kept at work by Mr. Becker, mathematical instrument maker, in Columbia Street, Brooklyn, New York. A chronometer movement causes a small slate to advance for twenty-four hours from one end of a box, towards a Becker compound aneroid pile at the other end, armed with two long slender brass tentacles, between the ends of which the slate passes forward. Small slate-pencils, at the tips of the tentacles, are made to touch the two sides of the slate simultaneously, five minutes before each of the twenty-four hours of the day, and are simultaneously removed five minutes after each hour. The record-curves (barometric on the one side of the slate, and thermometric on the other), consist therefore of short lines, each ten minutes long. At the end of the twenty-four hours, a detent shoots the slate back and a new record begins. Instead of a slate, paper

cards can be used and filed away. The weather reports in the "New York Times" are furnished by Mr. Becker's instrument. The Becker aneroid pile is essentially the same which Mr. Beaumont employs in his manufacture of steam gauges and aneroid barometers, in Centre Street, New York.

Pending nominations Nos. 397 to 415 were read, and the Society adjourned.

Stated Meeting, July 20, 1860.

Present, six members.

Professor CRESSON, Vice-President, in the Chair.

Letters acknowledging the reception of the last issue of Transactions, Proceedings, Laws, and List of Members, were read from the Royal Academy at Berlin, dated December 31, 1859; the Horticultural Society, Berlin, April 5; the Royal Society, Edinburgh, April 28, 1859; the Massachusetts Historical Society, and Mr. Edward Everett, of Boston, June 16; the Corporation of Harvard College, June 18; the American Antiquarian Society, June 25; the Connecticut Historical Society, Hartford, and Charles W. Polman, of New York, in behalf of the Westeraas Library, in Sweden, June 20; the New Jersey Historical Society, Newark, and the State Library, at Harrisburg, June 20; the Smithsonian Institution, at Washington, dated March 16, March 21, and April 15, and the Academy of Science, at St. Louis, June 23, 1860.

Letters announcing donations were read from the Royal Academy, Berlin, dated December 31; the Imperial Academy, Vienna, March, 1860; the Horticultural Society, at Berlin, April 5, and W. C. H. Staring, of Harlem, January 16, 1860.

The following donations for the Library were announced:

Monatsbericht der Königlichen Preuss. Akad. der Wissen. zu Berlin, Jan. to Dec., 1859, except May.—Abhandlungen derselben für 1858. 1000 pp. 4to. Für 1854. 800 pp. 4to, being 2d supplement-band and separate memoir, as follows:

Die Spuren der Astekischen Sprache im nordlichen Mexico, und höheren Amerikanischen Norden. Zugleich, eine musterung der Völker und Sprachen des nordlichen Mexico, und der Westseite Nord Amerikas, von Guadalaxara an bis zum Eismeer: von Joh. Carl Ed. Buschmann, Berlin, 1859.

Sitzungberichte der Kaiserlichen Akad. der Wissenschaften. *Mathematisch naturwissenschaftliche Classe*, XXXVII Band, Nos. 21, 22; XXXVIII, 23, 24, 25, 26, 27, 28; XXXIX, 1, 2. *Philosophisch-historische Classe*, XXX Band, 2, 3 heften, February, March, 1859; XXXII 2, 3, 4 October, November, December, 1859, 8vo.

Bulletin de l'Academie Imperiale des Sciences de St. Petersburg, Tome I, feuilles 1, 2, 3, 4, 5, 6, 7, 8, 9. 4°. (This commences a new series and reunites the two former bulletins, Physeo-Mathématique and Historico-Philologique; but the Mélanges will continue to be published separately in six classes: Astronomy and Mathematics, Physics and Chemistry, Biology, Russian, Grecian, and Asiatic.)

Mémoires de l'Academie, in fifteen separate numbers, composing Tome I, 4to.

Verhandlungen des Vereines zur Beförderung des Gartenbaues in den Königliche Preussichen Staaten, VII Jahrgang, 2 heften, Oct., Dec., 1859. 8vo. (This ends the series. The Society has resolved to make Koch's Wochenschrift its future organ.)

Wochenschrift des Vereines zur Beförderung des Gartenbaues in den Königliche Preussichen Staaten für Gärtnerei und Planzenkunde. Redigirt von dem General Secretair des Vereins, Professor Dr. Koch, Nos. 1 to 13. From 5 Jan. to 29 Marz., 1860. Berlin. Large 8vo.

Monographie des brachiopodes fossiles du terrain crétacé supérieur du Duché de Limbourg, par J. Bosquet. Extrait du troisième Vol. des Mém. pour servir á la description géologique de la Néerland. Acad. R. des Sci. Haarlem, 1859. 4to. (To be followed by others, if acknowledged.)

Extrait du programme de la Société Hollandaise des Sciences, pour l'année 1860. 4 pages, 4to.

The Northmen in Iceland. Société Royal des Antiquaires du Nord. Seance annuelle de 14 May, 1859. (Bound vol. 50 pp. 8vo. containing list of members, &c.).

Cabinettel for Americanske oldsager, page 9 to 13. 8vo. and 4 page circular.

Monthly Notices of R. Astronomical Soc. Vol. XX, No. 7.

Quarterly Journal of the Chem. Soc. No. xlix.

Transactions of the Roy. Soc. of Edinburgh, Vol. XXII, Part 1, for 1857'8, and 1858'9. 8vo.

Proceedings of the same. Session 1858'9. 8vo.

Astronomical Journal, No. 135. Cambridge, Mass.

Proceedings of the B. S. N. H., Vol. VII, 17, 18. 8vo.

Thirty-sixth Annual Report of the Officers of the Retreat for the Insane at Hartford, Conn., April, 1860. Pamph. 40 pp. 8vo.

Am. Journal Sci. Art., July, 1860. XXX, 80.—*From the ed.*

Mercantile Lib. Assoc., Thirty-ninth Ann. Rep., 1859'60. 8vo.

Charter, &c. of the Cooper Union, 1859. 8vo.—*From J. T. Hodge.*

Journal, Franklin Institute, July, 1860. (XL, 1.)

Proceedings, Acad. N. S., Philadelphia, Sep., 145, 192. 1860.

Am. Journal of the Medical Sciences, July, 1860.—*From the pub.*

Medical News and Library, July, 1860.—*From the publishers.*

African Repository, July, 1860.—*From the Am. Col. Soc.*

Second Ann. Rep. Chicago Charitable Eye and Ear Infirmary, presented by the Board of Surgeons, May 1, 1860. 8 pp. 8vo.

Wahnemungen bei einer bereisung des Kupfer-und bleigebietes im N. W. theile der V. S. N. Amer., Von Dr. Charles Meyer Wetherill, aus dem Englishen manuscript übersetzt von A. H. Grafen Marschall. (Aus dem Jahrbuche der K. K. G. R. Wien, VII J., 1856, IV vier. Seite 771.)—*From the author.*

Smithsonian Contributions to Knowledge, Vol. XI.—*From the Inst.*

Journal of the Select Council of the City of Philadelphia, Nov. 10, 1859; May 3, 1860. 8vo. Phila. 1860.

Report of the Pennsylvania Hospital for the Insane, for 1859, by Thomas S. Kirkbride, M.D. 8vo. pamph.—*From the author.*

Professor Lesley exhibited and explained a new aneroid, made lately to his order, by Becker & Sons, 54 Columbia Street, Brooklyn. Two piles of six small air-boxes each,

operate side by side together, through a medial rod and two bent levers, upon a pinion on the axle of the index. The pinion is driven by a T ratchet, set crosswise of the second lever end. It is bent to an arc of about one and a-half inches radius, and armed with forty minute teeth. The heel of this lever is provided with adjusting screws to determine the proportional motion of the index to the air-box lids. The index point, outside, traverses the entire circuit of the dial-plate during a rise or fall of *two mercurial* inches, so that the half-hundredth divisions on the dial-plate enable the topographer to read altitudes of five feet, which he can subdivide by the eye, after practice, into *single feet.* The instrument is made with great nicety and beauty, and satisfies a want long felt by practical field geologists. The accomplished maker considers it thermo-compensating; but Mr. Lesley's long experience with aneroids of various make and size, leads him to believe that this beautiful instrument, so far in advance of any other yet constructed, will prove no exception to the rule, that it is necessary to provide for each instrument its own scale of thermometric variation. The adjusting screws within, will enable the observer to make the instrument conform either to a mercurial standard reading half-hundredths of a mercurial inch,—or to a hypsometric standard of a thousand feet. In the former case, a proportional correction must be made of thousandths of an inch to a foot; in the latter case, the instrument will, within a moderate range, make the correction itself. To meet the difficulty of recording great altitudes (over two thousand feet), Mr. Becker has applied an exterior adjustment. A large set screw, marked with the barometric inches on a small scale, projects below, and returns the index to the place of commencement after that a great ascent or descent has carried it round the circle.

Prof. Cresson described the plans of Prof. Lowe, the æronaut, for crossing the Atlantic in thirty hours, by a balloon of seven hundred thousand cubic feet capacity (using but four hundred thousand), charged with city gas (of forty pounds to the thousand feet ascensional power), and floating in the highest, and therefore swiftest, northeastward moving strata

of the atmosphere, the intense cold of which he will oppose by slaking lime in iron box-stoves.

Pending nominations Nos. 397 to 415 were read and balloted for; and, there being no further business, the ballot-boxes were opened, and the following named gentlemen declared duly elected members of the Society:

Dr. F. V. Hayden, of Washington.
Mr. Sidney George Fisher, of Philadelphia.
Sir Roderick Impy Murchison, of England.
Rev. Adam Sedgewick, of England.
Prof. Léonce Elie de Beaumont, of Paris.
Prof. Henry Milne Edwards, of Paris.
Dr. H. D. Bronn, of Heidelberg.
Dr. Theodor Ludwig Wilhelm Bischoff, of München.
Dr. Hermann Von Meyer, of Frankfort-on-Maine.
Prof. Andreas Wagner, of München.
Prof. Joseph Hyrtl, of Vienna.
Sir William Logan, of Montreal.
Prof. Heinrich Rose, of Berlin.
Prof. George Jäger, of Stuttgard.
M. St. Clair Deville, of Paris.
Prof. William H. Harvey, of Dublin.
Prof. Jean Baptiste Dumas, of Paris.
Mr. Edward Verneuil, of Paris.
Mr. Claude Bernard, of Paris.

And the Society was adjourned.

Stated Meeting, August 17, 1860.

Present, two members.

The following donations for the Library were announced:—

Bulletin de l'Academie Royale, 1858. T. IV, V, 1859. T. VI, 8vo.
Tables générales et analytiques du Recueil des Bulletins de l'Academie, 1re serie. Tome I à XXII (1832 and 1856), 8vo. 1858.
Mémoires Couronnés et autres Mémoires, publiés par l'Academie. Tome VIII, 8vo. 1859. Tome XXIX, 4to. 1858.
Mémoires de l'Academie, 4to. Tome XXXI. 1859. Bruxelles.
Annales de l'Observatoire, 4to. Tome XIV. 1859. Bruxelles.
Obs. des Phén. Period. (Ex. de T. XXXI, des Mém. de l'Acad.)
Annuaires de l'Acad. et de l'Obs. for 1859. 12mo. and 16mo.
Rymbybel van Jacob Van Maerlant. Published by the Government and in the name of the Academie, with Introduction, Variis lectionibus, &c., by T. David, Professor of the Catholic High School; in Low Dutch, 8vo, unbound. Tweede deel. (The first part hereafter.) 1859.
Discours de M. A. Quetelet. Pamphlet. 8vo.
Note sur un Principe Remarquable en Géometrie, par M. E. Quetelet. Pamphlet. 8vo.
Obs. des Passages de la lune, &c. A. Quetelet. 8vo.
Eclipse de Soleil du 15 Mars, 1858. 8vo.
Météorologie et Astronomie. 1858. 8vo.
Note sur l'Aurore de 21 Av. 1859.
Sur les Etoiles filantes et le Magnetisme terrestre. A. Quetelet. 8vo.
Géodesie, Magnetisme. 8vo.
Magnetisme Terrestre. 8vo.
Reduction du Temps des Oscillations d'une Aiguille aimanteé à un arc evanouissant.
Lettre de M. Hansteen a M. Er. Quetelet. 8vo.
Sur le Magnetisme terrestre. A. Quetelet. 8vo.
Table de Mortalité, &c. A. Quetelet. 8vo.

(The above are pamphlet extracts from the bulletins of the Academie.)

Institutes of Medicine, by Martyn Paine. 8vo. 5th edit. 1859.
27th Annual Report of the R. Cornwall Polytechnic Society. "

Stated Meeting, September 21, 1860.

Present, twelve members.

Judge SHARSWOOD, Vice-President, in the Chair.

Letters were read from newly-elected members, Sir William Logan, dated Montreal, August 1, 1860, and Mr. Sidney George Fisher, dated Rising Sun Lane, July 30, 1860, acknowledging the receipt of notice of their election.

Letters, acknowledging the receipt of the Society's publications, were read from the Royal Academy at Bruxelles, the American Oriental Society, and the American Statistical Society.

The following donations for the Library were announced :—

Transactions of the Philosophical Institute of Victoria (January, August, 1859), vol. IV, part i. J. McAdam, Hon. Secretary and Editor. Melbourne, 8vo.
Catalogue of the Lepidepterous Insects in the Museum of Natural History at the E. I. House, by T. Horsfield and F. Moore. Vol. II. 8vo. London. 1858–'59.
Monthly Notices of the R. Ast. Soc., XX. No. 8.
Proceedings R. S. Edinburgh. Sessions 1858–'59.
Journal R. Dublin Soc. No. xvi (January), xvii (April). 1860.
Proceedings B. S. N. H. Sigs. 19, 20 (July, August). 1860.
The Astr. Journal. Nos. 136, 137, 138, 139.—*From the editor.*
Amer. Jour. S. and A. for September, 1860.—*From the editors.*
Journal A. Oriental S., VI. Nos. 1, 2. 1859–'60.
Ann. Report, School Com. Providence, R. I. June, 1860.
Collections, Conn. Hist. S. Vol. I. 1860. Bound, 332 pp., 8vo.
Proceedings Acad. N. S. Phil. Sigs. 12 to 24. 1860.
Journal Franklin Institute, for August and September, 1860.
Medical News and Library, " " *From the publishers.*
The Evangelical Repository, XVIII, Nos. 3 to 6, 10 to 12; XIX, Nos. 1 to 4. 1859–'60.—*From W. Young.*

Jour. Proc. 76th Convention, Protestant Episcopal Church in the Diocese of Pennsylvania, held in Philadelphia, May 22–4. 4to. 1860. 8vo. 240 pp.

Jour. Proc. General Convention, Protestant Episcopal Church in the United States, 1859, with Constitution and Digest of the Canons. Phila., 1860. 8vo. (600 pp.) like the last, unbound.

Twelfth Ann. Report Maryland Institute. Balt., 1860. Bd. vol. 8vo.

The African Repository, for August, September, 1860.

Boletin de la Sociedad de Naturalistas Neo Granadinos. Bogota, Londres, 1860. Pamphlet, 24 pp.

Notes on the Apparent Universality of a Principle Analogous to Vegetation, on the Physical Nature of Glass, and on the Probable Existence of Water in a State Corresponding to that of Glass, by Ed. W. Bayley, F. R. S. (Proc. Royal Society, X, 450). 1860. 8vo. Pamphlet. 11 pp.

Bibliotheca Historico-Naturalis, Physico-Chemica et Mathematica; Oder systematisch geordnete Ubersicht der in Deutschland und dem Ausland auf dem Gebiete der Gesammen Naturwissenschaften und der Mathamatik neuerschienenen Bücher. Herausgegeben von E. A. Zuholds. IX Jahr, 2 heft. Juli bis Dec., 1859. Göttingen. 8vo. (unbound, p. 140 to 250.) [With alphabetical register.]

Illustrated Catalogue of Optical Instruments. McAllister & Brother. Philadelphia, 8vo. Pamphlet, 100 pp.

On the Impurities of Commercial Zinc, &c., by C. W. Elliott and F. H. Storer, (Mem. A. A. A. S.) 4to. Pamphlet, 40 pp.

The Manufacture of Vinegar, its Theory and Practice, by C. M. Wetherill. Philadelphia, 1860. 8vo. 300 pp.

Artificial Lactation, by C. M. Wetherill. (Trans. Indiana State Med. Soc.) May, 1860. 8vo. Pamphlet, 6 pp.

On the Relative Cost of Illumination in Lafayette, Indiana, by C. M. Wetherill. New York, 1860. Large 8vo. pamph., 12 pp.

The Mountain. By R. M. S. Jackson, M.D. Philadelphia, 1860. 8vo. 600 pp.—*From Dr. C. Meigs.*

The decease of a member of the Society, M. André Marie Constant Duméril (born at Amiens, January 1, 1774), at Paris, in August last, aged 86, was announced by the Librarian.

An obituary notice of the late Mr. H. D. Gilpin was read by Mr. Joseph R. Ingersoll, as follows:

It is not always easy to account for the success that appears habitually to accompany the career of particular individuals. Where great merit exists, the circumstance seems naturally to explain itself. But good fortune is not necessarily or at all times the companion of great qualities. It is in some respects capricious, and many persons in ordinary life have thought that they had reason to put faith, as Bonaparte did in war, in the influence of a friendly star. One of the richest private men of the age is said to have disclaimed all right on the score of abilities and skill, or even of careful management of his affairs, and to have imputed his wonderful prosperity to what he modestly called luck. A very moderate degree of merit, and a seeming indifference to opportunities for gathering riches within easy reach, do not prevent the accidents of many a life from being marked with a frequent attainment of wealth. It may happen, too, though perhaps more rarely, that much positive desert, combined with laborious and apparently well-directed exertions, will fail to receive a just reward in what are regarded the gifts of fortune. Each of these conditions must be looked upon as an exception to a sound general rule. As such they are far from disproving its reality or its soundness. They serve, indeed, while the departures from it are only occasional, to confirm the existence and establish the truth of a principle, worthy to be cherished in all the relations of life. Otherwise they would be strange contradictions in practice of some of the best lessons of philosophy. They are at variance with established maxims of wisdom, with daily lessons of experience, with doctrines of universal morality, and with the earnest and virtuous promptings of conscious and enlightened duty. Could they be considered in any other light, they would go far to impeach the instructions which should never be lost sight of, that foresight and discretion are commonly the companions of virtue, and that folly is often the forerunner of crime. Cause and effect, are inherent in our nature. Their immediate connection is not always to be seen. It is nevertheless true that almost every event in the history of individuals or nations, although not easily to be traced to its sometimes hidden origin, is the result of a possibly remote, but efficient cause. Merit and demerit, and the fruits of them in conduct must have their consequences. The safest lesson that philosophy can teach, is that the fortunate are the wise. Contingencies exist in all human affairs against which the utmost prudence cannot always guard. Open hostility sometimes, and that of a secret and insidious kind still more frequently, is entertained against the deserving. The

maxim is well founded, that every beginning is arduous. Difficulties unseen and unknown as well as such as are perceived, beset its path, and do not always vanish when the novelty of the undertaking is worn away. The wisest cannot at all times foresee everything that is before them; and the bravest may be unable to overcome combinations whether anticipated by the efforts of reason or overlooked by them. With all these possible dangers and obstacles, there can be no doubt that an union of good qualities of head and mind and heart, carried firmly into practical use, will not only always deserve, but will in general command success. Clear intelligence, sound morality, and benevolent feeling, animating the conduct, and manifested with unaffected simplicity in outward deportment, will in most instances, dispel difficulties however obstinate, and triumph over the most formidable dangers. It is happy, not only for the individual possessor of them, but for the best interests of social life, with which he is surrounded, that these ingredients of character, each of them of value in itself, but inestimable when combined in spirit and practised together, are reflected by general esteem, respect, and gratitude.

To the honor of human nature it is sometimes seen, that success has been almost uniformly the companion of merit during the career of a long and active life. This companionship of desert and reward may not always have attracted the observation of the unthinking world, but the truth has nevertheless existed, although by the mass of men unperceived, and the discerning few have known, that it at least was hidden in the centre. The one has been the natural if not the necessary consequence of the other, and not a mere accidental coincident. Even commonplace attention to duties is productive of obvious results. Why should not loftier habits be equally fruitful in the accomplishment of great ends? Industry is necessary for the attainment of knowledge and skill. Warm friendships must be for the most part a return for acts and feelings of kindness and regard. Sympathy is the most grateful emotion of the heart. Tokens of respect from the world are the result not merely of heroism and other brilliant qualities, but more commonly of good conduct in the every-day intercourse of life, and especially of liberality and kindness in word and action. Happily illustrations are not wanting in familiar intercourse. The absence of them would be a sorry proof of the degeneracy of the age. If they are rare, the fact cannot justly be pleaded in extenuation of wilful error, or of an under-estimate of the value of wisdom and virtue, or of determined

and persevering efforts to do what is right. Other and more exalted motives for good conduct, besides and above the policy of it, are experienced in a self-approving conscience, and the tranquil feeling of satisfaction, if not of elevated enjoyment. Should it happen now and then that disappointment of positive reward follows proper actions, the monitor within is a lasting and more than sufficient equivalent.

In proceeding to discharge, however imperfectly, the duty I am called upon to perform, the course of reflection which has been submitted, seemed not inappropriate as preliminary; and could scarcely escape the mind of one who was long in friendly relations with the subject of this obituary notice. He was a striking proof of merit and success in apt and ordinary coincidence. A record of his course of life becomes appropriate to this Society. It is history teaching by example, which is a rich department of the science of philosophy. A familiar acquaintance with his character and his pursuits, which were always in consistency with it, will not be an unprofitable lesson. His conduct was such, that although not many of his contemporaries may be found to resemble him, yet an imitation of it, while worthy of the efforts of the most ambitious, need not be avoided by any extreme of modesty. Without resorting to any violent efforts, either in transactions of business and the performance of duty, or in the exhibitions of voluntary usefulness, he appeared to reach the desired ends, by steady and well-directed pursuit. Perhaps the very absence of excessive effort was, unconsciously to himself, one of the efficient causes of their being attained. A mind and body gently stimulated to moderate but adequate activity by due self-reliance, and happy in the continual exercise of it, under the guidance of integrity and good feeling, but avoiding errors that are too commonly consequences of undue zeal and precipitancy, are the most likely to succeed. The possessor of them, to quote from high authority, is "like a tree planted by the rivers of water, that bringeth forth his fruit in his season; his leaf also shall not wither, and whatsoever he doeth shall prosper." Discretion is the essence of wisdom. It is the master key that ought to unlock fortune's casket. This golden rule is as ancient as it is general and true. In application and exercise, it is nearly as multiplied as the families of the human race. All history confirms, and experience exhibits to the concurring sense of the wise and virtuous, that to be discreet is to deserve if not to command good fortune.

It is a remarkable circumstance that in what was probably the last

act of business in the life of one who was so circumspect upon nearly every other occasion, the characteristic precaution of our departed fellow-member seems to have been forgotten by him. The will of Mr. Gilpin is believed to have been prepared by him some weeks, and perhaps even months, before it was executed. It was then written by himself, without conference or consultation with any one. It was not at any time exhibited or made known even to his wife, between whom and himself unlimited confidence prevailed. One offer or more was made by him to that effect, which was declined by her from motives of delicacy, or a feeling of tenderness and sensibility; and the contents were not actually known by her either before or after its execution, either in the original draught or final copy by the scrivener. He could scarcely have been aware of the extremity of his illness, and how nearly he had approached its fatal end, or the formal completion of the needful work would not have been delayed so long. He may, in a condition of much and increasing feebleness, have lost sight at the moment of the recent law of Pennsylvania, forbidding at the approach of death bequests to bodies politic or persons, in trust for religious or charitable uses. Or he may have hazarded a construction of the terms of the statute, which will give rise to difficulty. It would have been clearer and better for his cherished views, if the will had been made perfect in all respects, immediately after the original was written by his own hand. This original was destroyed, and a copy, literal in all particulars, was adopted. This was executed on the 17th of January, 1860, in the presence of three witnesses, in due and sufficient form. The life of the testator was then drawing towards its close, with all the perceptions of a bright intellect altogether unimpaired. He lived but twelve days afterwards. On the 29th of January, 1860, he breathed his last. Probate in the proper office was made on the 3d of February. Each event occurred within less than thirty days of the date and execution of the will.

It has been feared by some that the course of these transactions may prove to have been unfortunate for the ultimate objects of bounty and public spirit, named in the testament. A calendar month certainly did not elapse between the date of the instrument and the melancholy event which prevented the possibility of explanation or correction by the hand that made it, if such should be found to have been important. If these fears have any foundation, a counterpart may be made to appear of the maxim which claims good fortune for the legitimate offspring of discretion, by exhibiting evil fortune as

resulting from its absence at a critical moment. At the same time a signal proof may be afforded how the uniform facility with which discretion and success have gone along hand-in-hand together, with scarcely a failure, during a somewhat protracted life, may together cease as it approaches its close.

The will is peculiar, and strongly indicative of the character of the framer. With some small exceptions, the great bulk of a large estate is given in terms of warm affection and gratitude to the writer's amiable wife for her life. This is happily subject to no sort of contingency. It will take effect and be enjoyed by her in immediate and undisputed possession. This large endowment is accompanied by requesting her, however, to pay therefrom to his mother, whom he mentions in terms of the strongest endearment, annually, during her life, the sum of two thousand five hundred dollars. He gives to his wife absolutely all his furniture of every description, plate, and wines, except his books, manuscript and printed, and his pictures, statues, and works of art; and of these she is to have the uncontrolled use and possession during her life. Should his mother outlive his wife, he gives her, during her life, the income of his estate. Subject to the gift, devise, and bequest to his wife and mother, which he desires to be carried into full effect, he gives to the executors and trustees named in the will all his estate, real and personal, in trust for the following purposes. After the death of his wife and mother, whichever shall last occur, and after the entire payment of certain bequests, then to appropriate, &c., the rest and residue of the estate, as it may then be, in three equal parts. First, one-third part to certain trustees named, in trust, to invest and reinvest the same at interest in public stocks of the city of Philadelphia; and after a period of ten years, and as much longer as they may deem expedient, then to appropriate the income accumulated up to that time to the erection of a fire-proof library building, to be a part of a fire-proof edifice of the Historical Society of Pennsylvania, when one shall be erected, to be in itself fire-proof, entirely distinct from any other portion of the said edifice, though connected with and forming a part of it; and to be designated "The Gilpin Library of the Historical Society of Pennsylvania." After the Society's edifice and this library building shall be finished, then to appropriate to the use of the Gilpin Library annually the entire income of the said one-third part of the rest and residue, and to continue to invest and reinvest the principal in the public stocks aforesaid. He also directs the executors and trustees of his will to deliver to the last-named trus-

tees, when they shall deem it expedient, his entire library of books and manuscripts which he may possess at his death, to be placed in that Library.

The second of the one-third parts of the rest and residue he bequeaths in a manner similar to the first, for the erection of a fire-proof gallery of the Fine Arts, to be a part of a fire-proof edifice of the Academy, when one shall be erected, but to be entirely distinct, though connected with and forming a part of it; to be designated "The Gilpin Gallery of the Pennsylvania Academy of the Fine Arts." After the building and edifice shall be entirely completed, the entire income of this one-third to be annually appropriated to the use of the Gilpin Gallery, and the principal to continue to be invested and reinvested. He also requests the executors and trustees of his will to deliver to the trustees of the Gilpin Gallery all his pictures, statuary, and works of the fine arts, which he may possess at his death, including, if she will permit it, his wife's own portrait and statue, to be placed in and never to be taken from the Gallery. The remaining third-part of the rest and residue he bequeaths in a similar manner to the others, for the erection of a fire-proof library building, to be a part of a fire-proof edifice of the Historical Society of Chicago; to be designated "The Gilpin Library of the Historical Society of Chicago." After the edifice and building shall be completed, the entire income of this one-third to be appropriated to the use of this Gilpin Library, and the principal to continue to be invested and reinvested.

These principal items of the will have thus been set forth as characteristic marks of the taste and tendencies of the testator. His preference for books and works of art was habitual, and it was clearly manifested in his own collections, consisting of a large private library, and of marble statuary, which he had imported from Italy, and other productions of the same character. The above description of the legacies will serve also to furnish means of judging how far the danger may or may not be imminent of failure and disappointment in the expected fruits of benevolence and public spirit, from a correct interpretation of the Act of Assembly of Pennsylvania, which has been alluded to. In the event of such failure, these bounties would become subject to distribution according to law, without any guide from the will of the testator, as it contains no ultimate residuary clause, or other provision against contingencies. Could this possibility of defeat to his sanguine and cherished hopes have been imagined, it might readily have been guarded against by a few words of

conditional direction, which would have given certainty to favorite purposes, in defiance of jealous legislation and strained judicial construction.

An Act of Assembly of 26th April, 1855, contains a section (11) in these words: "No estate, real or personal, shall hereafter be bequeathed, devised, or conveyed to any body politic, or to any person, in trust for religious or charitable uses, except the same be done by deed or will, attested by two credible, and at the same time, disinterested witnesses, at least one calendar month before the decease of the testator or alienor; and all dispositions of property contrary hereto shall be void, and go to the residuary legatee or devisee, next of kin, or heirs, according to law: Provided, that any disposition of property within said period, *bona fide* made for a fair valuable consideration, shall not be hereby avoided."

This statute has been the subject of judicial determination before the Supreme Court of Pennsylvania. A will was made in 1856, and the testator died within less than a calendar month from its date. The residue of the estate, after payment of debts and liabilities, was left "in trust for the uses and purposes of Friends' Boarding-School at West Town." The heirs and next of kin filed their bill, alleging that the school was a religious and charitable institution; that they were the parties who would have been entitled to the estate if there had been no will; and asking for an order upon the executors to transfer the same to them. Learned and able arguments were submitted on both sides. It was contended for the complainants that the words of the statute, "religious and charitable uses," are used in their broadest significance. The effect of the will would be to cheapen education to those who *could* pay, and *give* it gratuitously to those who *could not*. This, it was submitted, constitutes a *charitable* institution. It was also a religious institution. It was established to encourage "a guarded education of their youth." It was confined to them, and was to be managed with "religious care and circumspection." On the other side it was contended that the words of a statute are to be taken in their ordinary and familiar signification, for *jus et norma loquendi* is governed by usage. But if the usage have been to construe the words of a statute, contrary to their obvious meaning by the vulgar tongue, and the common acceptation of terms, such usage is not to be regarded. It was plain that the Legislature was using words in their popular, and not in their scholastic or technical, sense: that not a single instance was to be found

where the Legislature intended the words "charitable" or "religious" to embrace the idea of "literary" or "scientific" bodies.

The court adopted the views of the complainants. "It was true," they said, "that the words of a statute are generally to be understood in their usual and most known signification, not so much regarding the propriety of grammar as their popular sense." But when terms of art or technical terms are used (and there is nothing in the statute to show that they were used in a restricted or popular sense), "they must be taken according to the acceptation of the learned in the art, trade, or science," to which they properly belong. The court entertained no doubt that the words were intended to embrace objects of a religious, literary, and scientific character, as well as those which related to the poor and afflicted. It was therefore decided that the dispositions in the will were void; and that the executors make distribution among the heirs and next of kin.

It would scarcely be in place here to question this learned decision; or, perhaps, even to examine into its bearing upon the will of Mr. Gilpin. The friends of the deceased, however, and the public at large, have made his bequests the topic of remark and discussion from the time they were known. Valuable institutions of literature, science, and art, are deeply interested in the construction of them. They are to take effect in any event, only at what may be hoped is a remote day, after the death of the wife and mother of the deceased, whichever shall last occur. The significance of these bequests in amount, the high character of the institutions for which they are designed, the characteristic public spirit and liberality breathed in them, even the mystery which belongs to their future and distant development, and the curiosity and concern naturally felt in the disposition of a large estate, different as it is from the more common course of testamentary disposal, have combined to prompt and justify a somewhat minute explanation. It is given in order that the friends of the deceased and the public at large may be prepared to meet the question, if it shall ever be formally agitated. It may not be wrong to add, that, although no technical judgment has been pronounced, yet sound legal minds are believed to have formed opinions favorable to the complete and literal fulfilment of the expressed purposes of the will.

In recurring to the habits of Mr. Gilpin's life, and noticing summarily its incidents, a combination will be found of devoted attention to official duty in successive places of public employment, and of readiness to turn to voluntary exercises, sometimes having public

ends in view, and sometimes of a more social character. He was industrious in both. In the latter kind of exercises he either obeyed the call of associations, political or literary, with which he was more or less closely connected, or entered from his own praiseworthy impulses, upon an arena where good taste and scholarship were displayed in speech and writing, congenial to his own feeling, and the pleased instruction of his friends. These employments were varied by a relaxation of literary leisure in the companionship of books, which supplied his stores of knowledge, and a moderate and cheerful indulgence in the enjoyments of domestic and social intercourse, in which he took a lively interest, and was always well received. He was not only never idle, but never without what may be regarded as sufficient occupation of the mind. He conversed freely and sensibly, always with entire delicacy of thought and speech, and with entire freedom from everything like personal detraction. Had his bodily exercises been as carefully attended to, his life would probably have been prolonged. It was perceived too late that he had not submitted to enough of this important discipline to give vigor to his frame, or to resist the encroachments of disease. Sedentary habits were agreeable to him. He preferred the repose of study to the activity of exercise. He did not even afford himself habitually the ordinary relief of an occasional walk, which in itself would have been an irksome effort to him. Always desirous of occupation, and seeking to be in the way of it, he turned to his library even at unseasonable moments. This would occur at a late period of the evening which had been passed for hours in the society of his friends. These habits will serve to explain the constancy of the engagements of his pen. He appears never to have tired of his desk. When not using it at the invitation of others, he gave it employment as a kind of duty or agreeable exercise for himself. This was, perhaps, the rather indulged from the fact, that among his accomplishments was that of writing an excellent hand.

With such tastes as these, which appear to have been inherent in his nature, and were fully developed in the progress of years, it was a happy circumstance that he had passed that portion of boyhood, which receives the elements of education, in a country where classical learning is especially cultivated. He had been at an early period carefully imbued with it. A school, at Hemel-Hempstead, twenty-three miles from London, was kept by Dr. Hamilton, a highly respectable and well-known teacher, who received and educated a very limited number of young gentlemen at a time.

Young Gilpin was at this school for four years, and the well-grounded tastes and acquirements there instilled never abandoned him. His immediate paternal ancestors were Americans, coming from a British stock. His father (Mr. Joshua Gilpin), was a highly respectable merchant of Philadelphia, and afterwards removed to the State of Delaware. He there continued to reside during the remainder of his life, connected with his brother in a large manufacturing establishment on the Brandywine. He participated, as long as his health continued, in the relations of social life, and in institutions of literature, science, and taste, in Philadelphia. He died after some years of delicate and infirm health, at the age of seventy-four, at Kentmere, in Delaware, that being the name given by him to the house which he built and occupied as his family residence. This name was derived from the legends and annals of the Gilpin family, in the north of England. It is stated, that about the year 1206, the Baron of Kendal gave to Richard de Guylpyn the ancestor, the manor of Kentmere, for his prowess and skill in killing a wild boar which had annoyed the forests of Westmoreland and Cumberland.

Henry D. Gilpin was born in Lancaster, England, the birthplace of his amiable mother, who survives him at an advanced age. His birth took place, April 14th, 1801; and his death, January 29th, 1860. He was thus in his fifty-ninth year, or fifty-eight years, nine months and fifteen days old. In very early infancy, he was brought (September, 1801), to this country with the family, which remained here until the year 1811. They, then, all returned to England. He was placed at the school which has been mentioned, and derived from good instruction, constitutional and habitual industry, and apt faculties, fondness for the languages of Greece and Rome, and advancement in an acquaintanceship with them, both of which were cultivated and improved during his life. In 1816, they returned for a permanent residence to the United States. The subject of our memoir received his college instructions at the University of Pennsylvania. After taking his degree there, he entered upon the study of the law, and was admitted to practice in 1822: having, while a student and under age, filled with credit, the place of Secretary of the Chesapeake and Delaware Canal Company, of which he afterwards became one of the directors.

He was now a member of a learned profession, and prepared to engage in its duties and responsibilities. He did not, however, at any time plunge into the vortex of early professional life to the

extent and with the chances that are common. He appeared willing to abide his time: secure in the possession of sufficient abilities, great good feelings, amiable manners, and strict integrity. He made his way in due season without having encountered, what Mr. Gibbon considered it necessary to traverse, under the spur of necessity,—"the thorny labyrinths of the law." He was happy at all times in the friendship of those who could promote his interests, while they extended to him personal kindness, and he cultivated the regard of such individuals with benefit to his private relations, and success in his public career. If he was favored with the smiles of fortune principally while engaged in official life, he was always faithful and intelligent, as well as upright and laborious as a civil officer of the government. He held in succession, several important places: District Attorney of the United States for the Eastern District of Pennsylvania (30th December, 1831); a second time 31st December, 1835; Government Director of the Bank of the United States (January, 1833); Solicitor of the Treasury (May, 1837); Attorney-General (January, 1840). He was nominated for the post of Governor of Michigan, and rejected by the Senate, 20th January, 1835, by a bare majority. His nomination for the second term of Bank Director was rejected. That also of District Attorney, for a second term, was at first rejected, although on the renewal of it, confirmed. His political friends, and those too of a personal character, deemed these rejections to be owing to the state of party feeling, rather than to any doubt of fitness on the part of the nominee. During a portion of the time of his official residence at Washington, the Commissioners under the Mexican Treaty met, and Mr. Gilpin represented as an advocate, many of the largest claims that were adjudicated by the Board. On these respectively, he received a commission, which amounted in the whole to so considerable a sum, as to become a broad foundation for the resources which he enjoyed and judiciously invested during life, and bequeathed in ample benevolence at his death.

If public offices were filled by him with much direct and incidental pecuniary advantage, places of a social and municipal kind were occupied with like fidelity and no emolument. He was, for a considerable length of time, a Director, and afterwards President of the Pennsylvania Academy of the Fine Arts; and was a Director and Vice-President of the Pennsylvania Historical Society. He was elected a Trustee of the University of Pennsylvania December 7, 1852, and presented his resignation April 6, 1858, on account of

the state of his health and engagements. He was elected by the Common Council a Director of the Girard College June 25, 1856, to serve from the ensuing July 1. In organizing the board, he drew the two years term; and "served faithfully and acceptably" until the 1st of July, 1858, when his term of office expired.

Discourses were delivered by him on various occasions. He was attached to the Democratic party, and not unfrequently pronounced an address to bodies of his associate politicians, and occasionally to literary and other societies. Of these the following have been preserved:—

1826, November 29. Annual Discourse before the Pennsylvania Academy of the Fine Arts.

1836, January 8. Speech at the Union and Harmony Celebration by Democratic citizens of Philadelphia.

1836, July 4. Speech at the Democratic Celebration of the Second Congressional District.

1845, May 23. Address before the Philomathean Society, at the University of Pennsylvania.

1847, November 22. Eulogy on Silas Wright, before the Young Men's Democratic Association.

1851, November 13. Eulogy on Silas Wright, before the Society of the Alumni, on the occasion of their annual celebration, at the University.

1851, June 2. Eulogy on Silas Wright, before the Academy of the Fine Arts.

1856, October 13. On the American Missions in Greece, at St. Luke's Church.

1856, December 4. Address on the Character of Franklin, before the Franklin Institute.

The controversy between the Executive of the Government and the Bank of the United States took place when Mr. Gilpin was a public director of that institution. It was carried on with zeal and acrimony. He was the author of various documents issued by the Government directors, and particularly of a memorial addressed to Congress, in alleged vindication of his immediate colleagues and himself, from an attack in the memorial of the majority of the board, which claimed a restoration of the deposits withheld by orders of the Government. This memorable dispute was kept in active agitation for a considerable length of time. It left behind much bitterness of feeling, which has probably not been altogether assuaged to the present day.

At an early period of professional life he contributed frequently to the press. In the year 1825 he undertook the editorship of the "Atlantic Souvenir," and wrote largely for its pages. In 1826 he completed the "Biography of the Signers of the Declaration of Independence" by the publication of the last three volumes. A new edition was soon prepared by him, with an original preface and many additions. He was a frequent contributor to the "American Quarterly Review," which was established in Philadelphia in the year 1829. A series of "Political Portraits" will be found also on the pages of the "Democratic Review," several of which are from his pen. Those of Edward Livingston and of Josiah Johnston are among them. A biographical notice by him of Mr. Livingston is also among the many well-written documents on the files of this Society. He was authorized to superintend the publication, under the auspices of Congress, of the "Madison Papers;" and it was done with great skill and fidelity, in three volumes, 8vo., 1840.

Shortly afterwards, the opinions of the Attorneys-General of the United States, previous to March, 1841, were published under his inspection.

He was the reporter of a volume of cases decided by Judge Hopkinson, in the United States District Court for the District of Pennsylvania, published in 1837.

He had compiled, in 1825, "A Northern Tour;" being a Guide to Saratoga, Lake George, Niagara, Canada, Boston, &c. &c.

He edited the "Atlantic Souvenir," 7 vols. 12mo, 1826–1832.

An Autobiography of Walter Scott was compiled from passages in his writings; published 1831. 1 vol. 12mo.

A very early publication consisted of "Essays on Import Duties and Prohibitions; translated from the French of Comte Chaptal, by Henry D. Gilpin," 1821.

He was the author of a preface to the Biography of Napoleon Bonaparte, by Sir Walter Scott.

The first political piece written by him is believed to have been a memorial of sundry citizens of Pennsylvania, relative to the treatment and removal of the Indians.

He prepared an Address of the Democratic Committee of Correspondence of Philadelphia in August, 1832; and in October of that year united with Judge Baldwin in an Address of the Democratic Committee of Correspondence of the City of Philadelphia, relative to the Missionaries and the State of Georgia.

He was jointly the author of a Report of the Debts and Effects of

the Bank of the United States and the Value of its Capital Stock on the 3d of March, 1856.

The Van Buren Executive Committee issued a Life of Martin Van Buren in Philadelphia, 5th January, 1844, written by Mr. Gilpin.

He was the author of many reviews of works of great variety—of history, travels, biography, poetry, discoveries, annals, law, &c.

He was occasionally devoted to the poetic muse. Productions of his in verse are found in the "Atlantic Souvenir."

His pen was prolific, and indulged itself in great variety. It drew freely from the resources of his own cultivated mind, and found ready illustration and support in the pages of a large library, by which his desk was surrounded. This love of literature and science was indulged of late years in occasional visits to the Astor Library in New York, which is rapidly developing itself into one of the most valuable and interesting collections of the age. The learned superintendent of that institution always received him with the congenial feelings of an instructed and inquiring intellect; and the kindest relations subsisted between them to the close of Mr. Gilpin's life.

It was not until one of the later years of his career that he visited the home of his ancestors, and there met and made many friends. He travelled with his excellent wife on the Continent of Europe, and penetrated into remoter regions of other sections of the world. He refreshed his knowledge of antiquity, which had been derived from books, by navigating the ancient Nile, and beholding the monuments of Egypt, which have stood amid the changes of mankind for thousands of years. While in Europe, not only did the scenes of modern elegance attract his notice in the capitals of Britain, and France, and Prussia, and Germany, but Rome became the object of especial and devoted study, not less than literal enjoyment. Her classic exhibitions and memorials of the past, as well as her splendid displays of modern and ancient art combined in gorgeous pageantry, and all the solemn and magnificent exercises of an attractive and brilliant form of worship, were before him. Greece, too, the land of Xenophon and Homer, as well as of Plato and Socrates, of Solon and Lycurgus, of Themistocles and Leonidas, of Demosthenes and Pericles, of scholars and philosophers, and statesmen and legislators, of heroes and orators, was not trodden without a full measure of delight.

He returned home and renewed his social and literary occupations. These were pursued for some few years with satisfaction and enjoyment. It was not long, however, before his health began to fail. A

frame not constitutionally robust, and still unhappily sedentary during a great portion of the year, although relieved by occasional excursions, could scarcely fail to exhibit symptoms of diminished health. Some of his favorite habits of a public nature were restrained, as he thought, from mere inclination; but an insidious malady was gradually doing its fatal work almost without being self-perceived. Strength failed him by degrees, and he was compelled to deny himself the little bodily exercise, to the utility and past neglect of which he had at length become sensible. On the 29th of January his career was closed by the hand of death. His merits will be long preserved in the recollection of his country and his many friends.

Most men who have lived lives of usefulness, and left distinguished names, have made themselves remarkable for qualities more or less peculiarly adapted to a particular pursuit. They have either manifested early tendencies for vocation and success in their proper spheres, or have anxiously cultivated faculties adapted to them. While duties uncongenial to their habits, inclinations, or abilities may neither have been sought by themselves, nor selected for them by others, they have entered upon employments accidentally provided for them, with inadequate facility and force, although their general capacities may have been fully equal to them. Faculties will commonly take their own direction, and in that direction they are most likely to excel. It might be supposed that talents which would make a brilliant advocate, would shine in the office of a statesman or in that which is prepared by the same course of study, of a judge. Such is not at all times the case. Disappointment is often felt by warm friends and long-standing admirers, not only at the beginning of the new career which is always hard, according to the familiar adage, but in the progress, which does not become easy, or the result successful. A lesson of practical wisdom might be learned from daily observation, that should serve to caution against yielding to ambition or the desire of gain, by exchanging a position which time has rendered familiar, and proved to be well adapted to the holder of it, for one of uncertain and precarious enjoyment, and doubtful accomplishment. It was the happy disposition of our late fellow-member, whose name you desire to record with honor, to be suited not to one pursuit alone, but to many. We have seen that in his literary occupations, by which he began to distinguish himself in early youth, and continued to do so throughout his life, he was happy as an eloquent and attractive writer, rendered especially so by his classic style. His professional habits were marked with an industry that

knew and feared no exhaustion, and without which substantial reputation has rarely been attained. Politically, he was invited to discharge some of the most responsible trusts under the General Government, and without the preliminary habits of legislative experience, he brought to them ample supplies of intellectual intelligence and practical fidelity. In social life he always bore an active and liberal part, mingling with the amenities of personal deportment, a well-conducted and generous hospitality. Throughout all these departments his classic stores gave him a never-failing standing and a general welcome in the most cultivated intercourse. Through the whole, were diffused the grace and gentleness of a temper the most amiable, which was conspicuous in conduct and manners, in business and in friendly association: while a well-known integrity and kindness of purpose, obtained for him respect and confidence along with affection and esteem among all who knew him. No one could be more gentle in carriage and kind in feeling in the closest relations of domestic life.

An obituary notice of the late Mr. Washington Irving was then read by Professor Coppée, as follows:*

Mr. President and Gentlemen of the
American Philosophical Society:—

My brief experience in this Society has taught me, that upon the decease of distinguished American members, it is usual to appoint their friends, or those particularly acquainted with their lives, social as well as public, to make fitting records of their reputation and their worth. This is at once appropriate and just.

In this instance that rule has not been followed. Many of our fellow-members enjoyed the friendship of our late illustrious colleague, Washington Irving. My personal acquaintance with him did not extend beyond a passing introduction.

I think the inference is plain. In honoring me with this appointment, the Society has called upon a member of professed literary position and avocation, to record the eulogy, and to analyze the literary

* For the facts and statements in this paper, the writer is indebted to the prefaces and notes to various editions of Irving's works; to Bryant's Eulogy; to "Irvingiana;" to the courtesy of M. Thomas, Esq., of Philadelphia, and to the excellent and comprehensive work of Mr. S. Austin Allibone, which on all such subjects supplies at once facts, correct judgment, and a genial sympathy with authors.

character of him who has been, not unjustly, styled the Father of American Literature. It is in this view that I regard the appointment; it is upon this impression I shall act. I shall attempt, with all humility, to present to you a few philosophical criticisms upon his works; I shall endeavor to indicate the characteristics of his genius; to mark his place in the grand Historic array of English Literature, of which American Literature,—he being its most prominent figure,—is destined to form a very brilliant part.

Nor should I be doing justice to the eminent Society before which I appear, did I shrink from pointing out what seem to me the few defects and irregularities, which, like necessary exceptions, give point to his greatness, his power, and the immortality of his fame.

I am well aware of the difficulties I encounter. I can advance little that is not already generally known. Irving's life has been for a long period known and read of all men; his every literary movement has been watched with eager interest. Nor shall we be wanting in more complete records of his career. His life-long friend and compeer, Mr. Bryant, has pronounced his eulogy, not without a somewhat critical analysis of his literary career; his nephew, Mr. P. M. Irving, will soon present to the world the history of his life, which will become an invaluable introduction to his beautiful works.

Washington Irving was born in the city of New York, on the third day of April, 1783, the year which closed the war of American independence. The locality of his birth is still pointed out. It is now covered with stores, and is the scene of busy commerce. His father was a Scotchman, his mother an English woman: strong and good reasons for that partiality which he is said to have always manifested towards the Old Country.

He entered early upon the career of an author, without having amassed those riches of classical scholarship which, up to that period, had been regarded in England and America as essential pre-requisites: but which, in this practical modern age, seem to be no longer of necessary importance.

In 1802, when he was nineteen years old, he was a regular contributor to the *Morning Chronicle*, a Democratic newspaper, edited by his elder brother. His assumed name was in keeping, as we shall see, with the character and style of his productions: it was "Jonathan Oldstyle." These seem to have been the first fugitive efforts of an imaginative mind, by way of variety to the exact and solid realities of his special study, which, at that time, was the law.

During this period he was a great walker, and wandered around New York in every direction, but particularly upon the banks of that

most attractive river, the Hudson. Here he could still gather the stories of the Revolution from those who had been the local actors in its scenes. He explored inlet and promontory; and was involuntarily putting away on the fly-leaf of memory's scrap-book such legends as that of Sleepy Hollow. On the opposite shore were Nyack and Haverstraw, with their undying memories, to be recalled in connection with the life of Washington.

He struck acquaintance with the old people; chimed in with the old customs, and listened with a double purpose to fireside legends and incidents.

In the year 1804 he was threatened with pulmonary disorder; and, abandoning for a time his legal studies, he set out to repair and confirm his health. He travelled in England, France, Spain, and Italy; everywhere a man of acute and practical observation, laying up in memory many sketches and tales of travel for future use, and cultivating that taste for art which lends such a charm to his descriptions.

In 1806 he returned to New York, and having resumed the study of the law, was at the close of that year admitted to the Bar.

But alas for the respectable profession of the law, to him the little taste of literature had given birth to greater desire. He was resolved to drink deep of the Pierian spring.

In 1807 appeared "Salmagundi; the Whim-Whams and Opinions of Launcelot Langstaff and others." The writers were Washington Irving, James K. Paulding, and William Irving. Modelled upon the "Tatler" and the "Spectator," and their numerous progeny, the "Idler," the "Rambler," and others, the last of which had been discontinued only fifty years before, this publication appeared in numbers, genially satirizing the whims and follies of the day, and giving amusement and literary variety in a period of great literary dearth. The studied style and quiet humor might place some papers of "Salmagundi," almost without detection, among the numbers of the "Spectator."

Disentombed, and placed among the many noble works which have produced his fame, it stands like a lay figure among the living. Irving himself set but little value upon it. In spite of Mr. Bryant's eulogy, it does not contain, in my humble opinion, a fair promise of Irving's future powers. I speak, perhaps, to some who enjoyed "Salmagundi" in their youth, and who may consider it harsh judgment; but I think that, had it not been for the later fame of Irving and Paulding, "Salmagundi" would scarcely be now remembered.

It must, however, be observed that our illustrious author was even thus acquiring that freedom of motion, that momentum, which was to launch him upon a prosperous, an unchecked career.

In 1809 he again appeared before the world, and this time he took it by storm. In connection with his brother, Dr. Peter Irving, he had sketched the plan of "Knickerbocker's History of New York." He elaborated and finished it himself. To test its character and merits, we may refer to two results, antithetical indeed, but equally significant.

If it raised up troops of friends, it awakened the self-righteous indignation of all the Knickerbockers of New York, the family of Vans, from Van Brummel, the inventor of Suppaun, to the Van Kortlands and Van Winkles, who thus indicated its power, and its truth also, for it proved them the lineal descendants of Walter the Doubter, William the Testy, and stout old Petèr Stuyvesant, who hated the English and Swedes, and who believed nothing good but what was Dutch, and nothing Dutch but what was good. Sir Walter Scott laughed over it until his sides ached, and his laughter was contagious, for the whole party at Abbotsford was made merry by it as it was read aloud.

Irving made a good-natured apology in print when he found that he had hurt the feelings of the living representatives of the Dutch families, as was indicated, among other ways, by Mr. Verplanck's pained and sorrowful allusion to it in one of his historical discourses; but, I believe, the later generations of Knickerbockers, accepting the apology, and, in part, becoming ashamed of this puerile testiness, now claim the work with pride, as the first fruits of New York genius.

From 1810 to 1817, Irving, having relinquished the law, was a merchant,—partner with his two brothers in an establishment conducted both in New York and Liverpool.

In this copartnership, Washington Irving was, however, not a very active member. He was already the favorite of his brothers, on account of his great literary promise, and he was admitted to the mercantile house as a means of eventually securing to him an independence which would give him literary leisure.

Success as a merchant, independence secured by invoices and commissions, might have paralyzed his pen: indeed, during the period just mentioned, his right hand seemed in some degree to forget its cunning.

He wrote a few sketches, principally naval biographies, in just

four volumes of the "Analectic Magazine," conducted in Philadelphia by Mr. Moses Thomas; of this he was for a few years the editor. The special interest connected with his contributions is due to their being published during the war of 1812, which made our navy and its worthy officers popular and famous.

His own reviews and biographical sketches are without any distinguishing mark in that periodical; those of Verplanck and others, being subscribed by certain letters. They are principally biographical sketches of Thomas Campbell, of Major Murray, of Robert Fulton, of Wertmüller, of Captain James Lawrence of the Chesapeake, of Lieutenant Burrows, of Commodore Perry, of Commodore Decatur before his death, and of George Frederick Cooke the actor. These are written in a popular style and are very interesting.

For the convenience of Irving, who resided in New York, Mr. Thomas had the magazine printed there, instead of in Philadelphia. Irving, with characteristic modesty, has refused to permit these magazine sketches to be collected in a volume.

Prosperity as a merchant might have led to no greater efforts of his genius: but that mysterious Providence, which orders all things right, withheld this success. In 1817 the mercantile house failed. Irving was thrown upon his own resources. His pen became his staff and support. Thus one merchant-prince out of thousands of aldermanic tastes and proportions was lost to the metropolis. One Irving, with no rival, was gained to American literature.

In 1819 he published the "Sketch-Book." The pieces were written in London, but sent to America for publication. The pseudonym was "Geoffrey Crayon, Gentleman."

It was received in both countries with unusual favor. In America, because it was the work of an American, in a time when there was no American literature; in England, because it was in parts illustrative of English life and manners, and because it leaned genially and reverently to English customs and prejudices, at a time when we were taught by even Christian example to love all our enemies, except the English; a sort of qualification to the Sermon on the Mount, yet existing in the creed of many. The "Sketch-Book" was essentially English; it was almost the first American book read in England; it was praised, I had almost said *unduly*, by English reviews. No! it was worthy of all their praise; for, does it not contain that noble notice of Roscoe, his fellow-merchant and author, his fellow-sufferer by the reverses of commerce? In it have we not the wonderful sleep of Rip Van Winkle, and the fearful headless horseman of Sleepy Hollow?

To an author avowedly seeking bread as well as fame, it was particularly successful. For the copyright of his next work, "Bracebridge Hall," he was offered one thousand guineas before Murray saw the manuscript.

I must pass over the "Tales of a Traveller," published in 1824, and severely criticised by the "London Quarterly," "Blackwood's," and the "Westminster Review," to come to his greatest work, the "Life and Voyages of Christopher Columbus." I have said his greatest work; I make no exception. It was an admirable choice of a subject. Columbus was the discoverer of America; it was scarcely a fond hyperbole which announced—

> "A Castilla y León,
> Nuevo mundo dió Colon."

He was, besides, a man whose history was full of romance; whose life was more stirring than that of fabled heroes in epic poem, or prose fiction. Irving was conceded to be the originator and father of the literature which was to flourish upon the soil discovered by Columbus, and was therefore the fitting chronicler of such a life.

In 1825, there had been published in Madrid,—a spasmodic flash of the dying flame of Spanish letters,—a compilation of voyages and discoveries, called "Coleccion de los Viages y Descubrimientos," &c.

At the suggestion of the American Minister to Spain, Mr. Alexander H. Everett, the equally gifted brother of Edward Everett, and Mr. O. Rich, American Consul at Madrid, Mr. Irving, then in the first vigor of a new and increasing reputation, examined these with the intention of translating some of them; but, afterwards, becoming much interested in them and other records which were freely thrown open to him, he determined to accost his great subject in an original work.

The "Columbus," commenced thus under most favorable auspices, was rapidly, but carefully, written; it appeared in 1828. Imbued with the spirit of the old chroniclers, gifted with an imagination equal to all the demands of his almost pictorial undertaking, he exhibits a regulated and calm historic judgment, which resists the temptation and checks the tendency to romance. It is a beautiful modern restoration of old chronicle. He did not design it to be a philosophic history. He guards himself, by calling it not *a history*, but *a life*.

With the magic power of an artist, he has more than compensated

for the lack of philosophy, by the apparent reality of his representations and the exquisite coloring of his descriptions; he brings the distant near; or rather, he carries us, like some Arabian enchanter, into that far distance; he plants us upon the deck of the Caravel; we stand beside that lonely admiral, that visionary viceroy of undiscovered realms, in his darkest moments: we share in

> ——"the emotions dread that filled
> *His* frame on that October night,
> When watching by the lonely mast
> He saw on shore the moving light,
> And felt, though darkness veiled his sight,
> The long-sought world was his at last."—B. Simmons.

Laying no claims to philosophy, the charming narrative was addressed to the great world of English and American readers, and that world has pronounced its opinion, in loud and continued applause.

Such I understand to be the significance of the gold medal presented by George IV, to Irving, for the greatest excellence in historical composition. There were two medals; the other was presented to Mr. Hallam. In both these awards, unlike as were the medallists, the first gentleman in Europe only echoed the voice of the educated people of England and America, who had already signified their approbation and delight.

The literary offspring of his Columbus, or rather of his Spanish researches, were numerous, and worthy their illustrious progenitor. They were the Chronicles of the Conquest of Granada, published in 1829; the Voyages of the Companions of Columbus, 1831; the Alhambra, 1832; the Legends of the Conquests of Spain, 1835; and, much later, during his rural retirement at Sunnyside, on the Hudson, the History of Mahomet and his Successors.

The Voyages of the Companions of Columbus, may be regarded as an appendix to his Columbus; not so rich in interest nor so carefully written; and, by no means, so generally read.

But as I read his story of Granada and the Alhambra, my fancy beholds him wandering in the gardens of the deserted palace, and plucking a beautiful flower from the luxuriant roses in the court of the lions. We stand by his side, we share his thoughts.

I fancy him gazing in reverie upon the Sierra Nevada and the Alpuxarras beyond, still resonant of Moorish war-cries and Christian defiance, as in the day when Granada was the last stronghold of the

Moors in Spain, and when, at length, with an echoing sigh, Boabdil el Chico turned to leave it forever.

These are but glimpses, beautiful, never to be forgotten, but not satisfactory; they awaken a burning desire for a wider, even a panoramic view of those thrilling scenes. We would know, what indeed, Irving did not design to tell, the details of that romantic history from which we may gather the philosophy of the Arab Moors in Spain.

There is not in history a more marvellous or more interesting subject than this.

Islam, proclaimed in the beginning of the seventh century, had succeeded in revolutionizing the Southern and Eastern world. When the angel showed to Mahomet the silken cloth covered with writing, he emulated the meekness of Moses; he said he could not read: his faith was to be one of labor, of practice; the written word was to be supplied only to meet the practical need. Then began the life of action: leaving their barren and rocky deserts and ledges, the Arabians carried the sword of the prophet everywhere. The first caliphs went to Greece and to Persia. Then they swarmed upon Egypt; they ran along the northern ledge of Africa. Mauritania came under their sway; its inhabitants were absorbed into the ever increasing army of the faithful; the fierce races of Tripoli, Tunis, Algiers and Morocco, robbers on land and already pirates at sea, were now imbued with a new spirit; religion without moral obligation,—fatalism and antinomianism combined; and, receiving the impulsion from their conquerors and converters, they rushed together, as Arab-Moors, across the small strait; and, in 711, not a century from the public annunciation that there was but one God, and Mahomet was his prophet, they had made their ineffaceable mark in Spain by the victory on the banks of the Guadalete. They spread over Spain like summer fire; only in the Asturias and in Biscay was a small kingdom of Christian Spaniards. The Moors were elsewhere masters: and in some respects they deserved to be.

They brought great improvements in the science of numbers and quantity; they originated *alchemy*, from which turbid fountain we have the noble and limpid stream of chemistry; they adorned that beautiful land with grand works of architecture; splendid palaces, magnificent arabesques, fine roads. Industry, ready and practical, was their social law. Literature and poetry, adorned with the figurative language of their Eastern origin, found, as yet, no rival in the North, where neither trouvères, ménestraux, nor troubadours had sprung into distinct and illustrious existence.

And yet into all these wonders of philosophy and art, English genius had scarcely looked: it was, it still to a great extent remains, a *terra incognita*, a historic land of the most inviting and attractive beauty.

On the hither confines stood Prescott in his "Ferdinand and Isabella;" and, again, in his masterly summary, preceding the story of the Moriscoes in his "Philip II."

In this same general field had wandered Irving in his "Alhambra," and his "Conquest of Granada." These were but the well-told stories of a wanderer, who sojourned there for a brief space in a desolate chamber of the Alhambra, which is still pointed out. His midnight rovings through the haunted courts and spirit-peopled streets of that suburban city, within the precincts of the great city; his long interrogative gaze at the arabesques, and tumbling columns of the alcazar; were only answered by a voice as from the dying past—"Come and interpret our meaning; we are but the symbols of a hidden wisdom which the world should know." Through Mr. Irving's Chronicles that voice has been heard and to some extent heeded.

It is worthy of especial notice that the history of Spain has fallen to the share of American writers, and nobly has the task been thus far performed. Prescott and Irving have approved themselves as master builders, and Mr. Ticknor, in his excellent work, has given voice and melody to the historic throngs which people this grand but unfinished structure. The great work yet remains to be completed.

With such examples and incentives; the field yet purely American, the subject yet only prepared for exploration, let us hope that it will be occupied by competent laborers, not unworthy the fame of their illustrious predecessors.

Our space forbids the mention of all Mr. Irving's works. Some of them were but literary job-work, well performed indeed as such, but having small claims to immortality.

His "Life of Oliver Goldsmith" is an easy, pleasant, unlabored effort. Many have supposed that Irving and Goldsmith were alike in many respects. Irving fosters the error by quoting some Italian verses apostrophizing Goldsmith as his master and exemplar. I pronounce the resemblance of men incorrect. They are of the same literary school only; that is the likeness.

Hazlitt, a severe, but never an ignorant critic, calls the "Sketch-Book" and "Bracebridge Hall" good American copies of British essayists and novelists. "Not only Mr. Irving's language," he says,

"is, with great taste and felicity, modelled on that of Addison, Goldsmith, Sterne, or McKenzie, but the thoughts and sentiments are taken at the rebound, and, as they are brought forward at the present period, want both freshness and probability."

This is unjust; but it furnishes us with a clue to the determination of Irving's literary resemblance to Goldsmith. He is truly of that school, *par inter primos.*

Mr. Bryant, in an affectionate spirit of generous eulogy, can scarcely find words to express his pleasure in perusing and re-perusing the biography of Goldsmith. Charming as it really is, it is a work of supererogation. Goldsmith's beautiful poems are his best, and should be his only eulogy; for Goldsmith's life and character, apart from these, entirely destroy the ideal which his genius has raised in our minds. Time cannot impair the clustering beauties of the "Deserted Village:" but Oliver Goldsmith is scarcely worth a biography. The chaplet of Irving, the glowing tribute of Macaulay, cannot make his tomb a pilgrim-shrine.

Mr. Irving, after seventeen years of varied and delightful experience of merited honors abroad, returned at length to the banks of the Hudson in February, 1832, and there settled himself for an enviable life; a life of domestic retirement and social comfort, but of unremitting literary labor. He bought a little farm, the modesty of which claimed the admiration of Mr. Thackeray, in that beautiful eulogy, "*Nil Nisi Bonum.*" He made his own home, its gables, its walks, and its lawns, and its immortal memories. Its literary name was "Wolfert's Roost;" its popular and characteristic cognomen was "Sunnyside."

His retirement was interrupted by his appointment as Minister to Spain, which post he held from 1842 to 1846. This was not his first diplomatic experience; he had been Secretary of Legation at London in 1829. In 1846 he returned to Sunnyside. There loved and reverenced by his relations—the younger being to him like children—distinguished by his friends, as the one most worthy of attention and respect,—cherished by his country, honored by the civilized world,—in a region of which he was the idol—for he had rendered it illustrious—he journeyed calmly to the end of his years, with one wish unfulfilled. At length there came a period when he might attempt the desired task. Measuring his remaining span of days, and testing the remnant of his strength,—finding his intellect uninjured, and his fine fancy undimmed,—the biographer of Columbus determined to write the life of Washington. It was a noble and

manly determination. How well that work has been accomplished every one knows, for every one has read the work. The fame of the writer gave a prestige to the book before it was read. The charm of the narrative causes the reader to forget the writer in the perusal.

It is on record that, when Washington Irving was an infant, his nurse, seeing George Washington, then President for the second term, pass by, ran with the child to the august patriot, saying, "This bairn was named for you, sir," and asked his blessing on the boy. It was kindly bestowed. If this blessing rested, in any sense as a holy obligation, to be gratefully acknowledged in after life, Irving has acknowledged and repaid it. All things considered, his "Life" is the fittest and noblest monument yet erected to the memory of Washington.

And yet Irving was too good, too uncritical, too reverential, to come boldly up to the great task of writing almost contemporary history. He enters upon it not as a historian, but as a panegyrist.

Indeed, sir, may I be pardoned for saying it, the history of Washington remains to be written. I question whether an American can do it; certainly it is yet too soon to look dispassionately at the magnificent theme. We are too near the colossus to discern its proportions. Washington is the American idol. We will bear the most extravagant, the most ill-directed, praise. Calm analysis of his character and actions is tame, if not offensive.

I would not be misunderstood; I share this reverence; I bow at the shrine of Washington; but I discern the difficulty, and have ventured to point it out.

Of all the biographies, that which errs the least in this respect is the work of that cool, calm, and deliberate writer, Chief Justice Marshall.*

But Marshall erred unconsciously in another particular. He knew Washington well; and having all the information which we could desire, his very familiarity with the subject caused him to neglect, to consider as unimportant much which would greatly elucidate the subject. Thus his work is too concise; there is no character-painting, no portraiture. We scarcely obtain fair glimpses of the great man as he strides amid the thrilling scenes of Colonial and Revolutionary history.

Mr. Sparks, having with great labor edited the writings of Wash-

* A just statement of the various Lives of Washington, and clear distinctions of their merits, have been given by George W. Greene, Esq., in his "Biographical Studies."

ington, wrote his Life rather as an introduction to these, than as a finished biography. Indeed, in a few words in praise of Marshall's Life, he disclaims the intention of entering into competition with it.

These are the principal biographers of Washington. It was, then, to supply a great want that Irving undertook this labor of love.

All the materials of former writers—and but little, if anything more—came into his hands. It was not so much his object to investigate originally and profoundly, as to invest what was already known with the charm of his narrative style; to make a book which men should read,—men and children who leave Marshall and Sparks upon the shelves unread; in a word, to do for Washington what he had done for Columbus.

This was a task of great difficulty. Columbus was the hero of romance or epic; Washington the man of stern realities. And yet, in this design, Irving has perfectly succeeded.

Chastened by age, and drawing nearer to the seat of eternal truth and justice, his charity is manifest in every page. We are struck with the evident anxiety to do justice throughout this work. Justice to the English is not an American failing. Mr. Irving had been accused of English partiality on several occasions. He had once altered a line of Bryant's poem when it was to be republished in England. He had published his own works with an affectionate preface in America; and had left it out in the English edition; and although the explanation in both cases was perfectly satisfactory, there were some grumblers left.

In Irving's Washington, the English are treated by a generous enemy. Even Tarleton, who, like Claverhouse, had been always represented as a devil incarnate, appears here as a stern, cold, and most energetic partisan officer, who would have done his work well anywhere, but was particularly relentless in pursuing those whom he regarded as traitors and rebels. I have seen the spots and heard the stories of his furious raids; but I think his cruelty is usually overdrawn.

If I may be permitted to criticise the work in general; for I should be unjust in searching for faults in detail, unless I could present also many of its numerous beauties, I would say that Irving lacks the power to analyze character; and in this work, he fails to collate events and men so as to produce true scenic effect. He gives you a beautiful current narrative, but not a true dramatic representation, as in his Columbus. These, with its spirit of panegyric, are its greatest faults. Let me offer a counter illustration:

Amid much that is entirely *recherché*, and difficult to read, I would point out men and scenes in Carlyle's Frederick the Great, of this vivid and dramatic character. Frederick William and the Crown Prince are as masterly portraits as any within the range of historic representation.

To complete, and not to derange the symmetry of this beautiful and illustrious life, death came at last. His great work finished; his greatness, which had been achieved in an age of greatness, the age of Scott, of Rogers, of Byron, of Moore, of Hallam, thus consummated and sealed; the cosmos of his literary creation, adjusted and equipoised; his old age green and happy, he awaited the signal of its approach. Nor did temporal things, as fortunate and pleasant as they were to him, veil the glories and the priceless value of an eternal inheritance. He looked for an unfading crown, when that of earthly laurel and myrtle should hang fading upon his tomb. He had not long to wait; there was no lingering of disease: *Euthanasia*, the dark angel with silver light upon his wings, gave but one gentle touch like the hand of sleep, and he had departed to a better country, "even a heavenly." The artist had gone to render a happy account to the Great Master.

An artist, in the noblest sense of that word, he claims the poet's eulogy.

> *Emigravit* is the inscription on the tombstone where he lies:—
> Dead he is not, but *departed*, for the artist never dies.

This departure took place on the 28th November, 1859.

There is no cause to mourn: to his immediate friends, of whose circle he was the chief ornament, it is, indeed, an irreparable loss: to the great world he lives still and ever in his beautiful works.

A few remarks as to his character, his influence, and his rank, must conclude this humble notice.

To say that Irving, as a writer, belongs to the *old regime*, that he is like Addison, may now seem like faint praise; for we live in a day of increasing intellectual activity, a day when many minds educated and strengthened by the accumulations of knowledge and the conflict of opinions, subsidize all learning and all knowledge, and send it forth condensed through the columns of a myriad press.

But who is there among us who cannot go back to the time when Addison, long dead, still ruled the world of letters? when he was the model of an English style. I remember well being often told so, in the sententious words of Dr. Johnson, now sounding

simply absurd, that he who would acquire a fine English style must give his days and nights to the study of Addison.

Mr. Irving comes upon the literary stage just in this period. He adopts Dr. Johnson's advice: he models his style, I had almost said *unconsciously*, upon the English essayists; but, writing amid new circumstances and modern accessories, he is not trammelled by their *dicta;* he becomes less and less Addisonian, and more and more his own excellent and unequalled self. His English was pure and vigorous Saxon. Mr. Marsh, in stating his vocabulary, finds in "the Stout Gentleman" *eighty-five* per cent of Saxon words, and in "Westminster Abbey" seventy-seven per cent;—the additional number of Latin words in the latter, being due to the description of *armorial bearings*, *chivalrous exploits*, and *pageantry* of the *crusaders*.* His style became less ornate as he advanced in years.

Let any one compare the stately ornaments and studied construction of his "Columbus," which are criticised by Hazlitt, with the conciseness and almost severity of his "Washington." In the one, his fancy finds vent in epithets superlative and sonorous, but not always carefully chosen: in the other, he is a purist, using words which express the exact meaning and no more; and yet never becoming bald in expression, or losing the harmony of his periods. In all his works, his style is like the flow of a noble river, whose surface is not of lake-like smoothness, but is ever changing with the beautiful ripples and varying color of the waters, as they flow beneath the light of a noonday sun.

Of him, more than in any American writer, Buffon's aphorism is true: "The style is the man himself." He stands as the connecting link between the present and the past of English literature, nobly acknowledging the demands and the pressure of the present stirring period, but checking with the truest conservatism that great revolution which was sweeping away all former English poetry, with Wordsworth and the Lakers, and ignoring all the essayists as antiquated and outlandish.

We are struck with the fact that much of his reputation is a home reputation; his honor, unprophet-like, began in his own country, and was based upon the simplest legends and stories. Perhaps this was one secret of his success. The legend of Sleepy Hollow, is an old tradition of the early farmers. His "Rip Van Winkle" is from the German of Grimm, and Grimm found it among the peasants of Germany.

* Lectures on "English Language," 126.

"The rude peasant sits
At evening in his smoky cot, and draws
With charcoal, uncouth figures on the wall.
The son of genius comes, footsore with travel,
* * * * * *
He takes the charcoal from the peasant's hand,
And by the magic of his touch at once
Transfigured, all its hidden virtues shine,
And, in the eyes of the astonished clown,
It gleams a diamond! Even thus transformed,
Rude popular traditions and old tales
Shine as immortal poems." * *

LONGFELLOW'S SPANISH STUDENT.

Such is the magic of Irving in the Sketch Book, the Crayon Miscellany, the Tales of a Traveller, and many of his minor works.

The life of Irving is remarkable for its unity and completeness; he was an author and nothing else. He did not divide the admiration of his countrymen by a variety of professions. Bancroft was a teacher, a politician, a diplomat, as well as a historian; Bryant is an editor as well as a true poet; Everett, a divine, a statesman, and a scholar; Webster, a lawyer, a senator, a jurisconsult, and an eminent orator; Holmes is a doctor, a professor, and a comic poet and satirist; but Irving occupied a single ground: he was a literary man, to whom we might point as of that profession and no other.

Connected with this unity of life is the remarkable symmetry of his literary career. It had most eminently the Aristotelian requisites of discourse—a beginning, a middle, and an ending.

Tracing with Columbus, in the early aspirations of his genius, the relaxing bounds of ocean, he may be called the Columbus of American letters; and he who, in his dignity, his purity, his self-respect, and his eminence, may most properly be called the Washington of our literature, crowns his glory by becoming the historian of Washington.

In conclusion, I beg you to look for a moment at Mr. Irving's sagacity in the choice of themes. A part of his success is due to his great subjects: they attract attention before perusal; but woe to the tyro who shall attempt them; his failure must render him ridiculous. On the other hand, assured fame to him who can master and control them as did Mr. Irving; who lives to complete his great design; and who, receiving the summons to a nobler immortality, when he is emphatically ready to die, verifies in the best manner the postulate of Solon. He was happier than Crœsus in his most fortunate days.

As time rolls on, the brightness of his individual virtues, the incense of friendship, the adulation of contemporaries, will be slowly disjoined from the *literature* of his works. They will be measured by the more rigorous standards of rhetoric, and the canons of historical criticism; and his place will be more justly assigned him among the writers of his age. Without that indiscriminating eulogy which is unjust to others, simple justice will then rank him as the first of the purely literary authors of his period.

A communication was read from Col. Graham, dated Chicago, July 19, 1860, relating to certain geographical determinations, and the discovery of a lunar tidal wave in Lake Michigan, as follows:—

CHICAGO, ILLINOIS, July 19, 1860.

To the Secretary of the American Philosophical Society, Philadelphia:

Dear Sir: I have made all the necessary astronomical observations and electric signals for determining the latitude and longitude of twelve additional positions in the West; but have been so pressed with my public duties, that I have not been able to take up their computation. When I can find time to do so, I will communicate them, as heretofore, for the "Society's Proceedings." I find that, in several instances, they will give results differing much from those given in the published maps.

I have now nearly completed a paper, which I intend to offer for publication in the "Society's Transactions," on the Discovery and Demonstration of the Existence of a Semi-Diurnal Lunar Tidal Wave on Lake Michigan. It is based on nine thousand one hundred and eighty-four (9184) observations made on the tide-gauge, at Chicago, of the elevation of the surface of this lake, between the 1st of January and the 1st of July, 1859.

The observations were carried on uninterruptedly, both day and night (except in a few instances, when violent storms would have rendered them inaccurate), at intervals of half an hour, as a general rule, and sometimes at intervals of fifteen minutes of time apart.

From this series of observations we deduced the half-hourly (and in two places the quarter-hourly) co-ordinates of altitude of the lake surface, compared with the time (before and after) of the moon's meridian transit, as follows. Here each co-ordinate, expressed in decimals of a foot, is derived from a mean of three hundred and forty (340) observations.

LUNAR TIDE ON LAKE MICHIGAN.

Accompanying Memoir by Lieut. Colonel J.D. Graham, U.S. Topographical Engineers.

Fig. 1. The average, or mean result of all the observations, (9,184 in number), made half-hourly at Chicago, between the 1st of January and the 1st of July 1859.

Note. Each co-ordinate of altitude is derived from a mean of 340 Observations, and is expressed in thousandths of a foot.

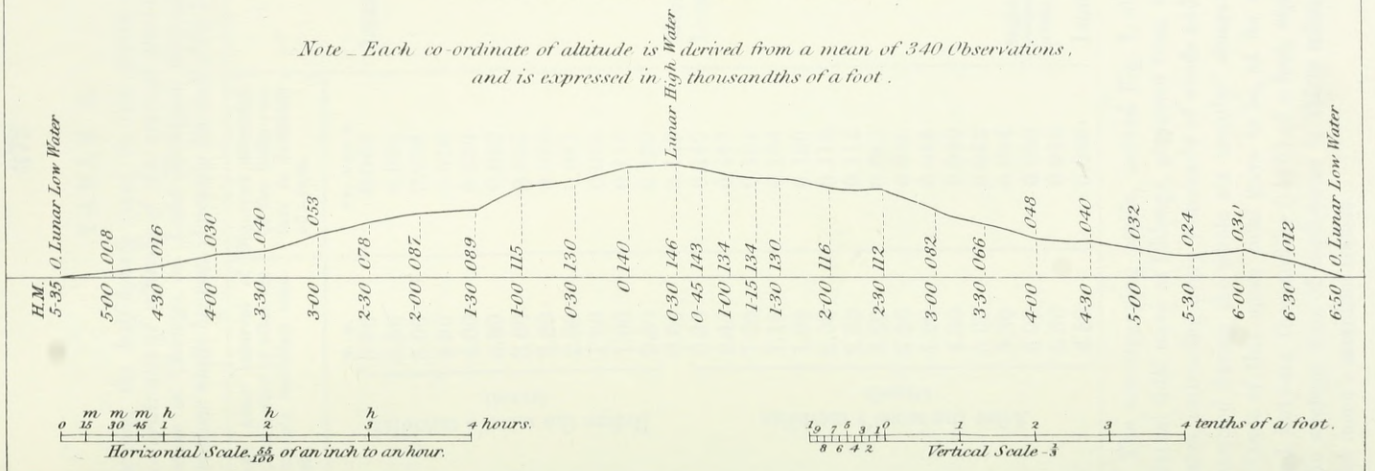


TABLE 1.

Showing the half-hourly (and in two places the quarter-hourly) co-ordinates of altitude of the average semi-diurnal lunar tidal wave at Chicago, on Lake Michigan, derived from 9184 *observations made between January* 1*st and July* 1*st*, 1859.

Mean solar interval of time before or after the moon's meridian transit.		Observed elevation of the Lake surface in decimals of a foot.	
	H. M.	FT. DEC'S.	
Before the moon's meridian transit.	5.35	0.000	Lunar mean low water.
	5.30	0.004	
	5.00	0.008	
	4.30	0.016	
	4.00	0.030	
	3.30	0.040	
	3.00	0.053	
	2.30	0.078	
	2.00	0.087	
	1.30	0.089	
	1.00	0.115	
	0.30	0.130	
	0.00	0.140	Moon in the meridian.
After the moon's meridian transit.	0.30	0.140	Lunar mean high water.
	0.45	0.143	
	1.00	0.134	
	1.15	0.134	
	1.30	0.130	
	2.00	0.116	
	2.30	0.112	
	3.00	0.082	
	3.30	0.066	
	4.00	0.048	
	4.30	0.040	
	5.00	0.032	
	5.30	0.024	Slightly discrepant, owing to a preponderance of unfavorable winds at this period.
	6.00	0.030	
	6.30	0.012	
	6.50	0.000	Lunar mean low water.

The accompanying profile, marked Fig. 1, shows the mean semi-diurnal tidal wave at Chicago, projected from the foregoing co-ordinates, embracing every vicissitude of winds and weather, &c., which occurred during the whole six months' observations. It shows the altitude of this mean tidal wave to be, at its summit, one hundred and forty-six thousandths (.146) of a foot, equal to $1\frac{3}{4}$ inches; and the average time of high-water is thirty minutes after the time of the moon's meridian transit.

On a close examination of all the observations embraced in the series, we find one hundred and eighty-nine (189) which we think ought to be rejected, because influenced in an extraordinary degree by unfavorable winds. This would reduce the number of observations in the series to 8995; and each co-ordinate of altitude would depend on a mean of three hundred and thirty-three observations, and stand as follows, viz.:

TABLE 2.

Showing the half-hourly (and in two places the quarter-hourly) co-ordinates of altitude of the average semi-diurnal lunar tidal wave, at Chicago, on Lake Michigan, as derived from 8995 *observations, made between January* 1, *and July* 1, 1859.

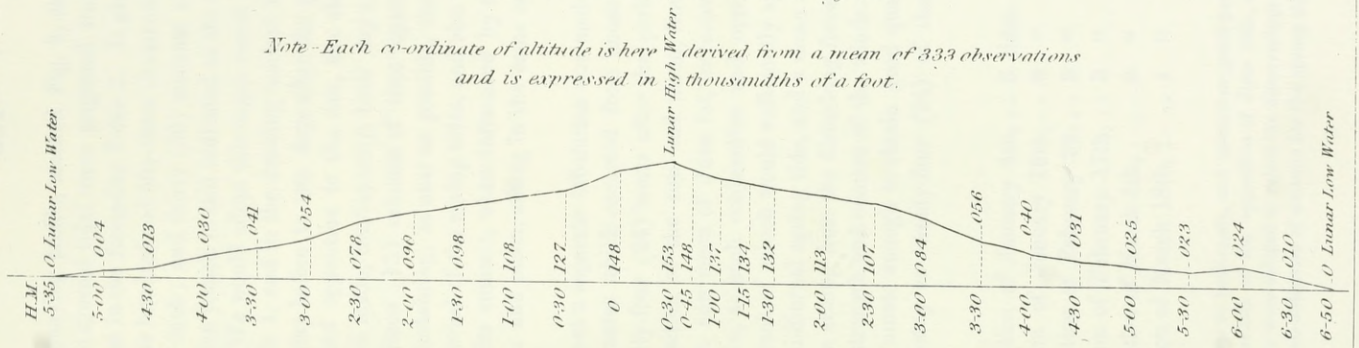
Mean solar interval of time before or after the moon's meridian transit.		Observed elevation of the Lake surface in decimals of a foot.	
	H. M.		
Before the moon's meridian transit.	5.35	0.000	Lunar mean low water.
	5.30	0.005	
	5.00	0.004	
	4.30	0.013	
	4.00	0 030	
	3.30	0.041	
	3.00	0.054	
	2.30	0.078	
	2.00	0.090	
	1.30	0.098	
	1.00	0.108	
	0.30	0.127	
	0.00	0.148	Moon in the meridian.
After the moon's meridian transit.	0.30	0.153	Lunar mean high water.
	0.45	0.148	
	1.00	0.137	
	1.15	0.134	
	1.30	0.132	
	2.00	0.113	
	2.30	0.107	
	3.00	0 084	
	3.30	0.056	
	4.00	0.040	
	4.30	0.031	
	5.00	0.025	
	5.30	0.023	
	6.00	0.024	
	6.30	0.010	
	6.50	0.000	Lunar mean low water.

LUNAR TIDE ON LAKE MICHIGAN.

Accompanying Memoir, by Lieut. Colonel J. D. Graham, U.S. Topographical Engineers.

Fig. 2. The average, or mean result of 8995 of the above 9184 half-hourly observations made at Chicago, between the 1st of January and the 1st of July 1859

Note – Each co-ordinate of altitude is here derived from a mean of 333 observations and is expressed in thousandths of a foot.



Horizontal Scale $\frac{25}{100}$ of an inch to 1 hour.

Vertical Scale $\frac{1}{3}$.

The accompanying profile, marked Fig. 2, shows the character of the mean semi-diurnal tidal wave projected from the modified general result given in the foregoing Table 2. It gives, for its altitude at its summit, one hundred and fifty-three thousandths (0.153) of a foot, equal to $1\frac{84}{100}$ inch; and thirty (30) minutes after the time of the moon's meridian transit is still indicated as the average time of lunar high water. We would adopt this mean result in preference to that shown in Table 1, and in the drawing marked Fig. 1.

From one day before to two days after the period of the moon's conjunction, and opposition to the sun, the observations upon the tide-gauge were made, continuously, both day and night, at regular intervals of fifteen (15) minutes of time apart. This was for the purpose of ascertaining, as near as possible, the time of lunar high water at the period of the spring tides, and also the elevation of the tidal wave at its summit, when influenced by the combined attraction of the sun and moon, acting in the same or nearly in the same direction.

For this object a separate tabulation was made of all the quarter-hourly co-ordinates which occurred from about twelve (12) hours before, to twenty-four (24) hours after the period of each conjunction and opposition of the sun and moon, from the new moon of January 4th to new moon of June 1st, inclusive.* In this way we hoped to obtain, at each conjunction and opposition, three semi-diurnal tides, each of which would sufficiently approximate in character to a semi-diurnal spring tide, and a mean of all would tend to eliminate errors arising from the disturbing forces, caused by irregularities in the strength and courses of the winds.

We were fortunate enough to obtain good quarter-hourly observations, for as many as twenty-four (24) of these spring tides, as follows, viz.:

At the conjunction of January 4th, . .	3	tides.
" opposition of January 18th, . .	3	"
" conjunction of February 2d, . .	3	"
" opposition of February 17th, . .	3	"
" conjunction of March 4th, ...	3	"
" opposition of March 18th, ...	1	"

* The winds were so boisterous, and caused so great perturbations of the lake surface, at the periods of the opposition of June 15th, and the conjunction of June 30th, that we were obliged to reject the observations made at those periods, in making up the co-ordinates of altitude for the spring tides.—J. D. G.

At the conjunction of April 3d, ... None; too stormy.
" opposition of April 17th, ... 3 tides.
" conjunction of May 2d, ... 1 "
" opposition of May 16th, ... 1 "
" conjunction of June 1st, ... 3 "
" opposition of June 15th, ... None; too stormy.
" conjunction of June 30th, ... None; too stormy.

Total, . . . 24

A direct mean of each quarter-hourly co-ordinate of altitude obtained from these twenty-four observed spring tides, is shown in the following Table 3, and the mean spring tidal wave, projected therefrom, is shown in the accompanying profile, marked Fig. 3. The whole number of observations incorporated in these, is twelve hundred (1200), and each co-ordinate is here derived from a mean of twenty-four (24) observations.

Thirty minutes after the time of the moon's meridian transit appears, again, as the time of high water at lunar spring tides, and we have two hundred and fifty-four thousandths (.254) of a foot, equal to $3\frac{48}{100}$ inches, United States measure, as the difference of elevation of the lake surface between high and low water of spring-tides.

We designate, as the *establishment* for the port of Chicago,

H. M.
¼ foot, 0.30.

It is probable that, if the effects of unfavorable winds, and all other disturbing forces which produce irregular oscillations in the elevation of the lake surface, could be fully eliminated, a semi-diurnal lunar tide would be shown, at the periods of the maximum springs, as great as one-third of a foot, or four inches.

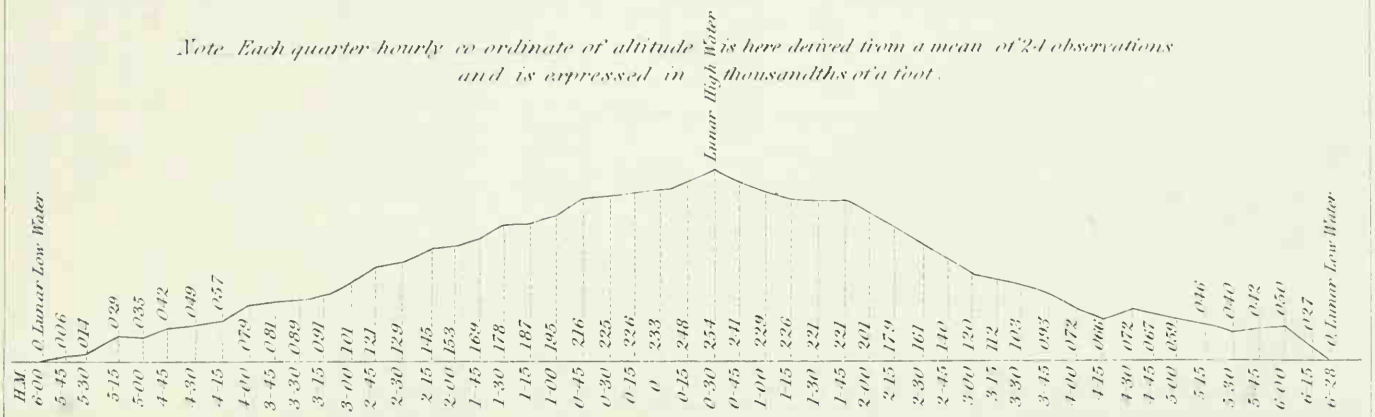
The time of low water, and the times of duration of the flood and ebb tides, are given approximately. The extreme rise of the lake tide being so little, and hence the time of the turn from ebb to flood,—attended frequently by disturbances of the winds,—being often uncertain within half an hour, it can only be determined with precision by means of numerous observations made at short intervals of time, say three to five minutes apart, from about one hour before to one hour after the turn of the tide from ebb to flood.

LUNAR TIDE ON LAKE MICHIGAN.

Accompanying Memoir, by Lieut. Colonel J.D. Graham, U.S. Topographical Engineers.

Fig. 3. The average, or mean result of 24 Semi diurnal Spring Tides observed quarter hourly at Chicago, between the 1st of January and the 1st of July 1859, based on 1200 observations.

Note. Each quarter hourly co ordinate of altitude is here derived from a mean of 24 observations and is expressed in thousandths of a foot.



Horizontal Scale $\frac{55}{100}$ of an inch to 1 hour.

Vertical Scale $\frac{1}{4}$.

TABLE 3.

Showing the quarter-hourly co-ordinates of altitude of the average semi-diurnal lunar spring tidal wave at Chicago, on Lake Michigan, as derived from 1200 *observations, made at and near the several periods of conjunction and opposition of the sun and moon, between January* 3*d and June* 2*d*, 1859.

Mean solar interval of time before or after the moon's meridian transit.		Observed elevation of the Lake surface in decimals of a foot.	
	H. M.	FT. DEC'S.	
Before the moon's meridian transit.	6.00	0.000	Low water of lunar spring tide.
	5.45	0.006	
	5.30	0.014	
	5.15	0.029	
	5.00	0.035	
	4.45	0.042	
	4·30	0.049	
	4.15	0.057	
	4.00	0.079	
	3.45	0.081	
	3.30	0.089	
	3.15	0.091	
	3.00	0.101	
	2.45	0.121	
	2.30	0.129	
	2.15	0.145	
	2.00	0.153	
	1.45	0.169	
	1.30	0.178	
	1.15	0.187	
	1.00	0.195	
	0.45	0.216	
	0.30	0.225	
	0.15	0.226	
	0.00	0.233	Moon in the meridian.

TABLE 3.—*Continued.*

	H. M.	FT. DEC'S.	
After the moon's meridian transit.	0.15	0.248	
	0.30	0.254	High water of lunar spring tide.
	0.45	0.241	
	1.00	0.229	
	1.15	0.226	
	1.30	0.221	
	1.45	0.221	
	2.00	0.201	
	2.15	0.179	
	2.30	0.161	
	2.45	0.140	
	3.00	0.120	
	3.15	0.112	
	3.30	0.103	
	3.45	0.093	
	4.00	0.072	
	4.15	0.066	
	4.30	0.072	Slightly discrepant, owing to a preponderance of unfavorable winds at this particular period.
	4.45	0.067	
	5.00	0 059	
	5.15	0.046	
	5.30	0.040	
	5.45	0.042	Slightly discrepant, owing to a preponderance of unfavorable winds at this particular period.
	6.00	0.050	
	6.15	0.027	
	6.28	0.000	Low water of lunar spring tide.

In conclusion, we present the foregoing observations as solving a problem which has been generally heretofore denied or doubted, and as proving the discovery of a semi-diurnal lunar tidal wave, of the dimensions herein described, on Lake Michigan; and hence we infer a similar one on the other great fresh-water lakes of North America.

J. D. GRAHAM,
Member of the Society.

Dr. Bache read an extract from a letter, dated Caermarthen, Wales, July 26, 1860, received by him from the President of the Society, Dr. George B. Wood, in relation to the recent discovery, in the valley of the Somme, in the northwest of France, of fossil bones, associated with rude implements of flint, certainly made by man, in the same geological stratum.

Prof. Cresson described some remarkable electrical phenomena, observed by him during the summer, showing clearly the dispersive mood of lightning.

In one instance, the lightning, after descending along the exterior of a maple tree, without damage to the tree, passed from the tree to a line of rails in an adjacent post-and-rail fence, where it parted in two opposite directions, to the distance of nearly eighty feet in each direction, demolishing the fence by bursting open the posts and splintering the rails: fragments of the rails being thrown to the distance of sixty feet or more.

In the other case, the lightning was seen to strike a cherry tree, standing about fifty feet from a line of telegraph wires, two in number, to which, from the tree, it leaped, and was then seen to pass in opposite directions along the wires. In one direction (eastward) it seems to have escaped wholly by the posts, many of which were splintered and several of them entirely demolished. Westwardly, the posts were left uninjured, the charge keeping the wires to their termination at a telegraph station at the City Gas Works, in the First Ward, nearly four thousand feet distant, destroying some of the instruments and stopping the clock at the precise moment of the occurrence of the phenomenon.

The Society was then adjourned.

Stated Meeting, October 5, 1860.

Present, nine members.

Judge SHARSWOOD, Vice-President, in the Chair.

A letter from the State Historical Society of Wisconsin was read, transmitting donations for the library.

The following donations for the Library were received:—

Cat. State Lib. Wisconsin. H. Rublee. Madison, 1860. Pamph. 8vo.—*From the Society.*

Cat. of Autographs. J. G. Bell, Manchester, Eng. 1860. P. 8vo.
Special-Karte des .....Wisconsin, &c., G. Riehter. Wisel, 1849. 8vo.
Geol. Ann. Reps. for 1855'8. Pereival, Hall, Daniels. 3 pamph. 8vo.
Wisconsin State Hist. Soc. Reports and Collections, IV, V. 8vo.
Wisconsin Ann. Messages of Gov. A. W. Randall, for 1858'9. 8vo.
Jahresbericht des Gen. Adj. Wiseonsin Militz. 1855. Pamph. 8vo.
Jaarlijksch Rapport van den Staats Opziener, &e. 1855. Pamph. 8vo.
Raport fra Undersogelses-Committeen, &c. 1859. Pamph. 8vo.
Laws of Wiseonsin . . . . . Organization and Government of Towns. E. M. Haines. Chicago, 1858. Pamph. 8vo.
An. Report of Commeree, Manuf., Pub. Imp., and R.R. System of Milwaukee for 1855'6'9. Pamph. 8vo.
School Code of Wisconsin. 1859. Pamph. 8vo.
An. Rep. (11th) on the Com. Schools of Wiseonsin, by L. C. Draper. 1859. Pamph. 8vo.
Proceedings of the Board of Regents of Normal Sehools, 1st Meeting. Madison, 1857. Pamph. 8vo.
An. Rep. (12th) of B. of R. of Univ. of Wise. for 1859. Pam. 8vo.
Rep. of Trus., &c. W. S. Hosp. for the Insane. 1859. Pamp. 8vo.
Wiscon. Senate Jour., 1858'9 ; App. 1857'8. 6 vols. Madison. 8vo.
Wisconsin Assem. Jour., 1857'8 ; Appendix, 1857'8. 5 vols.
Wisconsin Laws for 1857'8'9 ; Private Laws, 1858'9. 5 vols.
Wiseonsin Revised Statutes. Chieago, 1858. 8vo.
Wisconsin S. Agri. Soe. Trans., V. Madison, 1860. 8vo.
Ollendorff's Neue Methode .... zur Erlernung der Russ. spraehe; mit Sehüssel. M. Joel. 2 vols. Frankfurt a M. 1854. 8vo.—*From Prof. Röhrig, of Philadelphia.*
Logique de Hegel, traduit pour le premier fois, en accompagnée d'une introduction et d'une commentaire perpétuel, par A. Véra. 2 vols. Paris, 1859. 8vo.—*From Prof. Röhrig.*
Connecticut State Agricultural Society Transactions. 1859. Hartford, 1860. 8vo.—*From the Soc.*
St. Louis A. Sci. Trans. Vol. I, No. 4. 1860. 8vo.—*From the Ac.*
Canada Geological Survey, Report of Progress for 1859. Montreal. 8vo.—*From Sir W. Logan.*
Lon. Chem. S. Quar. Jour. No. L. 1860. 8vo.—*From the Soc.*
Evangelical Repos. June to Sept., 1860. Phila.—*From Mr. Young.*
Cambridge Astronomical Journal. No. cxl.—*From the Ed.*
Amer. Jour. Med. Sei. No. lxxx.—*From the Publishers.*
Med. News and Library. No. ccxiv.—*From the Pub.*

The following obituary notice of Judge Joel Jones, late member of the Society, was read by Judge Sharswood:—

The subject of this obituary notice was born the 22d October, 1796, in Coventry, Connecticut. On his father's side he was a lineal descendant of Col. John Jones, who married Henrietta, the second sister of Oliver Cromwell, and was one of the Judges who sat on the trial of Charles the First. Colonel Jones was one of Cromwell's House of Lords in 1653, and Lord Lieutenant of Ireland from 1650 to 1659. He was tried and beheaded for high treason October 17, 1660. His son, William Jones, was for several years Deputy Governor of New Haven and Connecticut. From him Joel Jones was the fourth in descent.

Joel entered Yale College in 1813, and graduated in 1817. He was, during this time, between the ages of seventeen and twenty-one, and was able to support himself by teaching school. The necessity he was under of doing this was, no doubt, a great advantage to him, as it has been to so many others. Nothing makes so accurate a scholar, or lays a more thorough foundation in the classics, while the habits of close attention and patience which are cultivated are of the utmost importance. Mr. Jones graduated with the highest honors of his class. He studied law with Judge Bristol, of New Haven, and afterwards in the Litchfield Law School, under the care of Judges Reeves and Gould. Upon the completion of his studies, his parents removed to Wilkesbarre, in this State. Joel accompanied them, and was admitted to practise law in Luzerne. He did not open an office there nor until he determined to settle in Easton. Here he occupied himself laboriously in law studies, and distinguished himself in some cases which required much research into forgotten if not obsolete law. He was counsel in the case of *Barnet* v. *Ihrie*, in which the old remedy of assize of nuisance was revived; and his argument for the plaintiff in error in the Supreme Court (17 S. & R. 187) is at once a testimony to his learning and industry. In 1830, the Legislature passed resolutions for the appointment by the Governor of "three competent persons, learned in the laws of this Commonwealth, as commissioners to revise, collate, and digest all such public acts and statutes of the Civil Code of this State, and all such British statutes in force in this State, as are general and permanent in their nature." Governor Wolf, who, having been a member of the bar of Northampton County, and associated with Mr. Jones, was well acquainted with his capacity, appointed him, with

the late William Rawle, Sr., and Thomas I. Wharton, to perform this highly important work. The commissioners were employed upon it for five years; but it was suffered to expire before it was completed. They reported annually to the Legislature, and many of their bills were adopted, though some of the most important were never acted upon. It is undoubtedly a useful and even necessary work, from time to time, to revise and digest the statute laws. Whatever opinion may be entertained upon the subject of codification generally, this much will be yielded. Acts of Assembly are often hastily penned by men who have no accurate knowledge of what the law was before, or even if well drawn they are often attended in the course of their passage by sudden amendments, hastily proposed and adopted. In making such revision, however, two things ought carefully to be observed,—that there should be no such change of language as would imply a change of the law, without a distinct report that such was the intention. The second is, that all the acts thus revised should be expressly repealed by their titles. The commissioners were not as careful as they might have been in these respects. It was perhaps their intention, at the close of their labors, to have reported a list of all the acts to be repealed, but it was never reached; and the consequence is, that, under the general clause repealing all such statutes or parts of statutes as were supplied by the Revised Code, the old statutes must still be referred to and studied to see if all their provisions have been supplied; and it is often an embarrassing question to determine how far they have been. As to the first point, the neglect of it has rendered it necessary for the Supreme Court to adopt a new canon of interpretation for the Revised Code specially; and the same thing has been done in New York. In other respects, though very slow in their labors, the commissioners evinced great learning and a sound conservative spirit in desiring rather to adapt the plastic character of our common-law forms of procedure to the objects of chancery jurisdiction, without creating separate courts of equity or vesting the judges of the common-law courts with unusual powers without the intervention of a jury. The opinion is a very common one at the bar, that it would have been better that our old familiar system of law and equity, alike administered by court and jury, which grew up among us by custom, —the silent legislation of the people,—had been continued and extended, rather than the present hybrid system introduced—law and equity on one side of the court, and equity exclusively on the other —in which the orator for equity grounds his bill for relief upon what

may be true in England or other States, but is a downright falsehood here, that he has no remedy or an inadequate one at law.

About the period when his labors as commissioner came to an end, —in 1835,—he was appointed by Governor Wolf one of the Judges of the District Court for the City and County of Philadelphia. He held this place for ten years, when, upon the renewal of the court in 1845, Judge Thomas M. Pettit having declined a reappointment as President of the Court, Judge Jones succeeded to his place. He continued to act as president for three years, when he resigned upon his election as President of the Girard College for Orphans. As a judge he was remarkable for great courtesy, immovable patience, and unwearied attention. He was therefore a safe though, it must be confessed, a slow judge. When he had once formed and expressed an opinion at Nisi Prius, which was after great deliberation, he was hardly ever known to change it. His law learning was very considerable, but it lay more among the ancient than the modern books; and it was with much difficulty that he could turn the current of his ideas upon legal subjects into new channels. Hence his decisions often seemed grounded upon mere technicalities, yet while it was certainly only the justice of the law which he aimed to administer, as every judge ought, yet it was evidently his great desire *suum cuique tribuere* whenever it could lawfully be done. He occupied the post of President of Girard College only eighteen months. His views and those of the Board of Directors not according on certain points connected with the institution, he resigned his post, and in the succeeding autumn was elected Mayor of Philadelphia, which place he filled for one year.

After this he returned to the bar in this city, at which he continued till his death, which took place February 3d, 1860, in the sixty-fourth year of his age. He always was and continued a hard student. After his return to the bar, he revised and enlarged Bouvier's Law Dictionary, and published a small volume entitled, "A Syllabus of the Law of Land Office Titles in Pennsylvania." He contributed to the American Law Register, and wrote a series of articles on American jurisprudence and the moulding of common-law forms to equitable doctrines, for several English law periodicals. He was an excellent Hebrew and Greek scholar, and an earnest student of the Bible in the original tongues. He published a volume entitled, "The Patriarchal Age, or the Story of Joseph," in which much critical acuteness as well as extensive Oriental erudition was exhibited. It has received high commendations from the

most eminent biblical scholars. He contributed largely to the religious periodicals on various topics, and for some time edited a religious magazine called "The Literalist." The title of the magazine indicated what was the fact, that he was a firm believer in the literal fulfilment of Scripture prophecy; and a large part of his time appears to have been devoted to the illustration and defence of this opinion. He left many manuscripts, some of which,—notes and comments on parts of the Bible,—are soon to be published.

He was truly exemplary in all the relations of life, a sincere Christian, and a good man. Kind in his disposition, yielding in his temper, affable in his manner, unbending in his integrity, and pure in his life; his memory, as that of the just, is blessed.

GEO. SHARSWOOD.

September 21st, 1860.

The decease of Andrea Mustoxidi, of Corfu, at Vienna, July 29, 1860, was announced by Professor Trego.

The subject of human remains in the Diluvial Formation, brought forward at the last meeting, was discussed.

And the Society was adjourned.

Stated Meeting October 19, 1860.

Dr. F. BACHE in the Chair.

Present, five members.

Letters were read from the Batavian Society, dated Rotterdam, January 12th; from P. A. T. Peters, dated Altona, April 16th; and from the University of Toronto, dated October 11th, 1860, acknowledging the receipt of the Transactions and Proceedings.

The following donations for the Library were received:—

Journal of the Franklin Institute Philada., for Oct.—*From the Inst.*
African Repository, for October, Washington.—*From A. Colon. S.*
Minutes of the 151st An. Meeting of the General Association of Connecticut. New Haven, 1860. 8vo. Pamph. 86 pp.

Mr. Lesley made a verbal communication respecting a deposit of quartz crystals and a deposit of a silicate of alumina between the roof rock and the top layer of an anthracite coal bed, and exhibited a fossil plant from the same neighborhood.

And the Society adjourned.

Stated Meeting November 2, 1860.

Prof. CRESSON, Vice-President, in the Chair.

Present, seven members.

Letters were read, acknowledging the receipt of the Transactions and Proceedings, from the Imperial Society of Naturalists at Moscow, dated May 12th; the Imperial Academy of Sciences at Vienna, dated April 20th; the Royal Saxon Society at Leipsig, dated May 1st; the Royal Society of Sciences at Göttingen, June 3d; the Royal Academy of Belgium, dated Bruxelles, March 20th; the Literary and Philosophical Society of Manchester, dated May 31st; and the Philosophical and Literary Society at Leeds, dated July 24th, 1860.

A letter was read from the Royal Bavarian Academy of Sciences, dated Munich, June 12th, 1860, acknowledging the receipt of Transactions and Proceedings, and requesting a complete second set of Transactions and Proceedings, for reasons stated, and an equivalent proposed, which, on motion of Mr. Fraley, was committed for consideration to the committee on the Library, with power to act.

Letters were read, transmitting donations for the Library, from the Imperial Academy at Vienna, dated June 25; the Royal Society at Göttingen, dated June 16th; the Imperial Academy at St. Petersburg, dated April 23d; and the Royal Geographical Society of London, dated July 24th, 1860.

The following donations for the library were received:—

Mémoires de l'Acad. Imp. de St. Petersbourg. T. II.

Mémoires par Divers Savants. T. VIII. 1859. 4to.

Bulletin de l'Acad. T. I, feuill. 10 to 36. Unbound. 4to.

Pulkowaer Beobachtungen des Grossen Cometen von 1858; von Struve und Winnecke. St. Pet., 1859. 4to.

Missbildungen, von Dr. W. Gruber.

Beitrag zum Verstandniss des Liber Census Daniae, von C. Schirren. Analyse und Kritik der Schrift Georgs von Brevern: der L. C. D. u. die anfänge der geschechte Harriens u. Wirlands (1219–1244). St. Pet., 1859. 4to. [All three last mémoires published by the Academy.]

Transactions ("Schriften," afterwards "Verhandlungen") der Russ.-Kais. Mineralogischen Gesell. zu St. Petersbourg. XVII, 1831; Plates, 1831; XVI, 2, 1842; (these three in Russian; the following in German); I, i, 1842; Jahr 1847; 1848'9; 1850'1; 1852'3; 1854; 1855'6; 1857'8. St. Pet. 8vo. (Each volume unbound, from 300 to 400 pages.)

Sitzungsberichte der K. Akad. phil. hist. Cl. XXXIII, i, ii, 1860. math. nat. Cl. XXXIX, iii, iv, v; XL, vii, viii, x, 1860.

Mittheilungen der K. K. Geog. G. Jahr. III, iii. Wien. 8vo.

Jahrbuch der K. K. Geol. R. Jahr. X, iii, iv, 1859. Wien. 8vo.

Jahresbericht (45th) der Nat. G. in Emd. (1859). Emd., 1860. 12mo.

Kleine Schriften. VI, Der Barometerstand .... Ostfrieslands, von Dr. Prestel. VII, Ein Betrag zur Klimatologie des Harzes, von C. L. Schoof; 2r Abdruck. Claustal, 1860.

Abhandlungen der K. G. zu Göttingen, VIII (1858'9). 1860. 4to.

Nachrichten, von der G. A. Univ. Nos. 1–20 (1859). 16mo.

Cat. der Antiken-Sammlung. Fr. von Thiersch. Münich, 1860. 8vo.

Bulletin de la Société Vaudoise des Sciences Naturelles. VI, xlv, xlvi. Lausanne, 1859'60. 8vo.

Annuaire de l'Acad. R. de Belgique (1860). 16mo.

Bulletins de l'Acad. (1859). T. VII, VIII. 8vo.

Mém. Couronnées et Autres Mém. IX (1859), X (1860). 8vo.

Annuaire de l'Obser. R. de Bruxelles (1860). 1859. 32mo.

Sur le Population de la Terre, d'apres Dièterici.

Relation d'un Voy. en Sicile et .... l'Italie, 1858.

Précis de l'Hist. de l'Astron. aux E. Unis. (All three 32mo extr., from l'Annuaire, and by Ed. Mailly.)

Sur la Différence de Long. des Observatoires de Bruxelles et de

Berlin, determineé en 1857 par signaux galvaniques. (Trans. from Encke's Mem. in M. Acad. R. de Berlin, for 1858, and extr. from 4to Annales de l'Obs. R. de Bruxelles.)

Rymbybel von J. v. Maerlant. III, J. David. Brux., 1859. 8vo.

Prospectus, Results.... Schlagintweit, 1854–8. To be published in 9 vols. Text, 3 vols. F. Atlas, by Brockhaus, of Leipsig.

Annales des Mines. XVI, v, vi. XVII, i. 1859'60. Paris. 8vo.

Phil. Trans. R. S. London. CXLIX, i, ii. 1859. 4to.

List of Fellows, &c. &c., 30th Nov., 1859. 4to.

Proceedings R. S. L. X, xxxvii, xxxviii, 1859'60. 8vo.

Notices of Proc. R. Inst. G. B. and I. IX. Lon., 1858'9. 8vo.

List of Members, &c. for 1858. London, 1859. 8vo.

Additions to the Library from July '58 to July '59. 8vo.

Report of Br. Ass. Aberdeen Meeting, 1859. Lon., 1860. 8vo.

Journal R. Geog. S. XXIX. London, 1859. 8vo.

Proceedings. IV, ii, iii. London, 1860. 8vo.

Ray Society, Inst. 1844. The Oceanic Hydrozoa, a Description of the Calycophoridæ and Physophoridæ. Obs. during the voy. of H. M. S. Rattlesnake, in 1846–1850, &c., by T. H. Huxley. London, 1859. 4to.—*From the R. S.*

Jour. of the S. of Arts, &c. VIII, cccIxxvi to cccCli. Lon., 1860. 8vo.

Ast. &c. Obs. Greenwich Obs. (1858). Lon., 1860. 4to.—*From R. S.*

Obs. at Mag. and Met. Obs. at St. Helena, with Discussions of Obs. at C. of G. Hope, &c. &c., by Sabine. II, 1844–'49. Lon., 1860. 4to.—*From the Brit. Gov.*

Journal of the R. Asiatic S. XVII, i, ii. Lon., 1860. 8vo.

Memoirs.... Lit. Phil. S. Manchester. XV, ii. Lon., 1860. 8vo.

Proceedings of the same. No. 1, 1858'9, pp. 60 to 250. 8vo.

On the Phosphates and Arseniates, by Dalton. Man., 1840. 8vo.

Leeds Phil. and Lit. S. An. Rep. for 1859'60. Pamph. 8vo.

Sensorial Vision; a Paper by Herschel. Leeds, 1858. 8vo.

The Physical Condition of the People in its bearings upon their Social and Moral Welfare; a Paper, by Bickersteth. Leeds, 1860. 8vo.

Rep. of Proc. of Geol. S. W. R. Yorksh. (1859). Leeds, 1860. 8vo.

Journal of R. Dublin S., Oct., 1859. XV. 8vo.

Proceedings B. S. N. H. VII, xxi, xxii. Boston, 1860. 8vo.

Cat. of Officers, &c. Harvard Un. for 1860'1. Cambridge. 16mo.

Proceedings Ac. N. S. Philadelphia, 1860. 25 to 28 sigs. 8vo.

Observations on the Form of the Occiput in the Various Races of

Men, by J. A. Meigs, M.D. (Extr. from last.) Philadelphia, 1860. 8vo.—*From the author.*

The Laws of Race as connected with Slavery, by the author of "The Law of the Territories," "Rustic Rhymes," &c. Phil., 1860. 8vo. Pamph.—*From S. G. Fisher.*

On motion the German Geological Society at Berlin and the Société Vaudoise des Sciences Naturelles at Lausanne were ordered to be placed on the list of corresponding societies.

And the meeting was adjourned.

Stated Meeting, Nov. 16, 1860.

Present ten members.

Mr. Isaac Lea, Vice President, in the Chair.

Letters were received from the Imperial Society of Naturalists, dated Moscow, 1st and 13th June; from the Royal Society of Sciences, dated Upsala, 4th August; from the Royal Saxon Society, dated Leipsig, 5th and 9th July; and from Thos. Lawson, Surgeon-General U. S. A., dated Washington, 7th November, 1860,—transmitting donations for the Library.

A letter was received from the Royal Society of Sciences, dated Upsala, 7th August, 1860, acknowledging the receipt of copies of the Transactions and Proceedings.

The following donations for the Library were announced:—

Librorum in bib. Speculæ Pulcovensis anno 1858 exeunte contentorum catalogus systematicus. O. Struve, Petropoli, 1860. Small 4to, unbound, 950 pages.—*From the Vice-Director of the Observatory.*

Receuil de Mémoires presentés a l'Académie des Sciences par les

Astronomes de Poulkova, &c. O. Struve, V.D. Vol. II. St. Pet. 1859. 4to.

Bulletin de la S. I. des Nat. de Moscow; pub. par Dr. Renard; ii, iii, iv, 1859; i, 1860. 8vo.

Nouveaux mém. de la S. I. des N. de Moscow; T. XI, XII, 1859'60. 4to.

Aorsskrift, K. Vetensk. S. i Upsala. 1° °arg. 1860. 8vo.

Nova acta R. S. S. Upsaliensis. Ser. tert. Vol. II. 1856–8. 4to.

Berichte .... der K. Sachs. G. der Wiss. zu Leipsig; *math. physiche classe*, i, ii, iii, iv (1859); *philolog.-historische classe*, i, ii, iii, iv (1859), i, ii (1860); 8vo.

Auseinandersetzung .... absoluten störungen der kl. planeten; 3d abh. Von P. A. Hansen. Leipsig, 1859. 8vo.

Die Melaneischen sprachen .... mit den Malaiisch-Polynesischen sprachen; von H. C. von der Gabelentz. Leipsig, 1860. 8vo.

Beiträge zur anatomie der Cycadeen; von G. Mettenius. Leipsig, 1860. 8vo.

Ueber seitenknospen bei Farnen; von G. Mettenius. Leipsig, 1860. 8vo.

Die classen der Hanefitischen rechtsgelehrten; von G. Flügel.

Ueber verhältnisse des binocularen sehens; von G. Th. Fechner. Leipsig, 1860. 8vo. (These six last are from the Abhand. der K. S. S. der W.)

Bulletin de la S. de Géog. 4th Serie, Vol. XIX. Paris, 1860. 8vo.

Memoirs of the R. Ast. S. XXVIII (1858'9) Lond. 1860. 4to.

Monthly notices of the R. A. S. XX, ix. London. 8vo.

Barthés and Lowell's bimonthly list of books. London. 8vo.

Proceedings of the L. and P. S. of Liverpool. No. XIV, 1860. 8vo.

Journal of the Franklin Institute. No. 419, Nov. Phil. 8vo.

Statistical report of the sickness and mortality in the U. S. A. from Jan. 1855 to Jan. 1860; by R. H. Coolidge, M.D., Ass. Surg. U. S. A. Washington, 1860. 4to. (514 pp. bound). Senate Document No. 52, 36th Cong., 1st Session.

The death of Hartman Kuhn, a member of the Society, at Philadelphia, on the 6th inst., aged 76 years, was announced by Dr. Franklin Bache.

New nomination No. 416 was read.

Dr. Bache renewed the subject of discussion at the last meeting, and moved that the Librarian be instructed to have

notices of the meetings sent to all members residing within ten miles of the Hall of the Society, with appended notes, stating the business, stated or special, of the meeting to be held, which was agreed to.

And the meeting was adjourned.

Stated Meeting, December 7th, 1860.

Present, twenty-eight members.

Professor CRESSON, Vice-President, in the Chair.

Letters acknowledging the receipt of the Society's publications were received from the Society of Antiquaries, dated London, November 16th; and from the Historical Society of Pennsylvania, dated Philadelphia, November 26th, 1860.

A letter was received from the Royal Academy, dated Lisbon, January 19th, 1858, announcing the transmission of thirty-two volumes of their publications.

A letter from G. B. Airy, Astronomer Royal, dated Greenwich, October 20, 1860, was read, furnishing a list of the publications of the observatory, from which deficiencies in the series may be supplied.

A letter from the President, Dr. G. B. Wood, was read, dated Paris, November 5th, 1860, giving information of a new Society (La Société de l'Anthropologie de Paris), and the donation of its first publications. On motion of the Librarian, that Society, and the Société Académique de l'Aube, at Troyes, were ordered to be placed on the list of corresponding societies.

The following donations for the Library were announced:

Bulletins, Soc. d' Anthropologie. T. I; i, ii. Paris, 1859 '60. 8vo.
Memoires de la même. T. I; i. 1860. 8vo.—*From Dr. Wood.*
Essai sur la theorie de la variation diur. barom., sur la const. de l'ether, &c. (Soc. Acad. de l'Aube), Par. C.-L. Henry. Troyes. 1860. 8vo.—*From the Author.*

Memoria da Acad. R. de Lisboa. T. XII; ii,—Sec. Ser. T. I, II, III, (5 Vols.)—Nova Ser. T. I; i, ii; T. II; i, (5 Vols.) 4to.
Portugalia monumenta historica, 2 fasciculi.
Annaes das Sci. e Let. T. I., 13 Nos.
Noticias ultramarinas, T. VI., 2 Nos.
Annales da Marinha. T. II., 1 No.
Colleccao de opusc. reimp. T. I; i. ii.—*From the Academy.*

Zoological Society, P. III, 1859; I, II, 1861. London. 8vo.—*From the Society.*

American Oriental Soc. Proc. Oct. 17. New Haven, 1860. 8vo.

American Journal, for November. New Haven, 1860. 8vo.

Astronom. Journal, No. 141. Cambridge, 1860. 4to.

Life Insurance Convention, at N. York, May 23, 1860. 8vo.—*From the Girard Ins. Co.*

Med. News and Library. Dec., Phila., 1860. 8vo.—*From the Pub.*

Acad. Nat. Sci. Proc. pp. 413–476. Phila., 1860. 8vo.

Obs. on the Genus Unio. Isaac Lea. VIII. i. Phila., 1860. 4to.

On Diseases peculiar to Women. By H. L. Hodge. Phila., 1860. 8vo.

Introductory Discourse on Speculative and Inductive Medicine; Med. Dep. Penn. Coll., Oct. 8. By H. Hartshorne, M. D., Phila., 1860. 8vo.—*These from the Authors.*

Further Remarks on Numerical Relations between Equivalents. By M. C. Lea (Ex. Am. J. S. and A.) Nov. 1860. 8vo.

Catalogue of the flowering Plants and Ferns of Ohio. By J. S. Newberry, M. D. (Ohio Agric. Rept., 1859.) Columbus, 1860. 8vo.

Report on the Economical Geology of the Route of the Ashtabula and New Lisbon R. R. By J. S. Newberry (made Nov. 1, 1856). Cleveland, 1857. 8vo.—*These from the Authors.*

Munsell's Catalogue of Rare, New, and Second Hand Books. Albany, 1860. 8vo.

Address before Agr. Soc. N. Castle Co. By S. G. Fisher, 1860. 8vo.

Etat Atmospherique le 16 Oct., 1860, à 8 h. m. Paris, (for all Europe); one sheet, 4to.

New Jersey Historical Soc. Proc. IX; i. 1860. pp. 56, 8vo.

An obituary notice of Dr. Chapman was read by Dr. John B. Biddle:

Nathaniel Chapman, ninth President of the American Philosophical Society, was descended from an ancient and honorable English family.

His paternal ancestor came to Virginia with the very first colony, under the auspices of Raleigh, to whom he was nearly related by blood. He had been a captain of cavalry in the British army, and received a considerable grant of land in the new territory, upon which his distinguished kinsman had just bestowed the appellation of the Virgin Queen.

The old seat of the Chapman family in Virginia is still in their possession, on the river Pomonkey, some twenty miles above Richmond. A branch of the family, about the year 1700, migrated to the adjoining State of Maryland, and fixed itself on the banks of the Potomac, nearly opposite Mount Vernon. They retained the designation of the ancient settlement, and called the new estate Pomonkey. From this branch Dr. Chapman is descended.

His father, however, returned to Virginia upon his marriage, and passed his life there. His wife was of that Scotch stock, of which so many were attracted to Virginia, in the early days of her tobacco trade. She was the daughter of Allan Macrae, of Dumfries, in Virginia, a merchant and tobacco factor, who accumulated a large fortune, which he bequeathed to his children.

Nathaniel Chapman, the second son of George Chapman and Amelia Macrae, was born on the 28th May, 1780, at his father's seat, Summer Hill, in Fairfax County, Virginia, on the banks of the Potomac. The ancient town of Alexandria, then the capital of north-eastern Virginia, was within a few miles of the seat of the Chapmans; and about equidistant stood the future site of Washington. At Alexandria, not many months before the birth of Chapman, in the December of the preceding year, was born another distinguished physician, who for nearly fifty years shared with him the best practice of Philadelphia,—Joseph Hartshorne.

These young men, destined in after life, in a distant city, to a long career of honorable rivalry, received the foundation of their scholastic education together, at the classical academy of Alexandria, founded by General Washington, and then under the direction of his able and accomplished friend and chaplain, the Rev. Dr. McGrath. Chapman remained here six years. Subsequently, for brief periods, he was an inmate of two other colleges, to neither of which, however, did he consider himself under any obligation.

The academical training of the Alexandria College must have been superior. Hartshorne and Chapman were both distinguished for thoroughness and accuracy of scholarship, and, through life, beyond

most of their professional contemporaries, were remarkable for devotion to general literature and belles-lettres.

At a very early age Chapman commenced the study of the profession which he so long illustrated and adorned. In the year 1797, when but little more than seventeen years of age, he came up to Philadelphia, for attendance on the medical lectures at the University of Pennsylvania. For two years previously he had been engaged in a course of preliminary reading, under the guidance of two neighboring physicians, both in their day men of no little note. A year he spent in the office of Dr. John Weems, of Georgetown, afterwards and now of the District of Columbia. Weems, a close friend and near relation of the Chapman family, was a practitioner of much local eminence. From his office, Chapman passed under the care of Dr. Dick, of Alexandria, then and still favorably known in the annals of American medicine.

At seventeen, a stranger, without fortune, connections, or influence, Chapman launched his bark in the crowded metropolis of the United States. At thirty-three, he had reached the front rank of his profession. Seated in a leading chair of the renowned American school of medicine, with the most desirable practice of a great city at his command, an eminent social favorite, distinguished as a wit and conversationalist, he enjoyed a position which left him nothing to desire. A rare combination of qualities had achieved this brilliant success. Energy, industry, professional aptitude, literary attainments had not alone accomplished it; there were moral, no less than intellectual, attributes which pushed him forward in the career of fortune.

A winning demeanor, remarkable conversational powers, an address which was the unmistakable pledge of a sympathizing heart,—these were the traits which at once made Chapman troops of powerful friends, and carried him over the heads of able competitors for the great prizes which he so early secured.

Upon his arrival in Philadelphia, Chapman became the private pupil of Rush, then in the zenith of his popularity and influence. With Rush he soon made himself a favorite, and there is little doubt that he was early destined by his preceptor for introduction into the University, if not for the succession to the Chair of Practice.

The Medical Faculty of the University of Pennsylvania, in the days of Chapman's pupilage, presented an array of names, which, with scarcely an exception, have become historical. Shippen, Wistar,

Rush, Barton, and Woodhouse, filled the four chairs, to which the organization was limited.

Shippen, the senior of the Faculty, and one of the founders of the school, had the three branches of Anatomy, Surgery, and Midwifery, with Wistar for his adjunct. Surgery was not a distinct professorship until 1805, when the commanding ability of Physick as a practitioner and teacher of surgical art led to the creation of the additional chair. It was not till 1810, after the death of Shippen, that the claims of Midwifery, as an independent practical branch of medicine, were admitted. Shippen, whose brilliant social as well as professional reputation is part of the traditional history of Philadelphia, is described by a student of those days—no friendly critic of the University Faculty,—Caldwell, as "in stature and figure, countenance, and general appearance, and style of manners, one of the most elegant and gentlemanly personages of the times, possessed of an excellent and well-cultivated mind, a polished, and when excited, an impressive, if not an eloquent public speaker."

Wistar, then comparatively young, and destined to be the survivor of the Faculty, was the personal favorite of the class. In general education beyond the standard of his day, with a preparatory professional training which an easy fortune had enabled him to prolong at home and abroad, fluent, imaginative, self-possessed, he has probably never been surpassed as a finished and instructive lecturer.

Barton's reputation in Natural Science gave no little éclat to the school. As a lecturer (in the admission of Caldwell, who showed much rancor to his memory), "he was eminently instrumental in giving to his branch the respectable rank it holds at present in our Schools of Medicine. Previously to his promotion to the chair of Materia Medica, the lectures delivered from it, in the United States, consisted of very little else than dry details of the names, classes, imputed properties, doses, and modes of preparation, and exhibition of medicinal substances."

Woodhouse, then recently elected to the chair of Chemistry, was distinguished as an experimental chemist. By Priestley, he was pronounced "equal, as an experimenter, to any one he had seen in either England or France." An enthusiast in devotion to analysis, he would doubtless have accomplished something brilliant, but he was cut off by apoplexy at the early age of thirty-eight.

Rush, however, was beyond cavil the bright star of the school, *facile princeps*. His theories have disappeared before the light of modern physiological investigation. But his genius made a lasting

impression on the medical opinions of his countrymen, and his ardor, fervor, and faith, were irresistible with his students.

Upon his graduation in the spring of 1800, Chapman presented an inaugural thesis on Hydrophobia, written at the request of Rush, in answer to an attack on the Professor's favorite theory of the pathology of that disease. He had previously prepared an essay on the sympathetic connections of the stomach with the rest of the body. This paper, afterwards read before the Philadelphia Medical Society, contained the germs of Chapman's doctrines, regarding the pathology of fever, as well as the *modus operandi* of medicines.

During his pupilage, Chapman found leisure to contribute to periodical literature. About this time "The Portfolio" was established, under the editorship of the celebrated Dennie. Our young Doctor wrote several articles for this journal, under the signature of Falkland. They refer chiefly to European politics, and are strongly tinctured with the anti-Gallican and anti-Bonapartist views, which then pervaded the Federal party of the country, of which the "Portfolio" set were strong partisans.

Chapman did not obtain the advantage of an hospital residence, upon his graduation in Philadelphia. His friend and compatriot, Hartshorne, was more fortunate. "Through the assistance of his uncles (then influential managers of the Hospital), and of other relatives, Hartshorne was enabled, in 1801, to secure an appointment to the post of Resident Apprentice and Apothecary, then vacant in the Pennsylvania Hospital." But Chapman, destitute of influence in these quarters, determined to seek the most celebrated schools and hospitals of Europe, with the view to the completion of his medical education.

He remained abroad three years, nearly one of which he spent in London, a private pupil of Abernethy's. This celebrated man had great powers as a teacher, and an unrivalled faculty of impressing the minds of his students. The founder of the Physiological School of Surgery, and the author of a rational constitutional treatment of surgical diseases, he carried his pathological views also into the domain of Medicine. Constitutional disorders, he maintained, either originate from, or are allied with derangements of the stomach and bowels, and can be reached only through these organs. These doctrines probably took no little hold of the mind of his young American pupil. They are traceable throughout his future teachings and writings.

There was something, moreover, congenial in the temperaments

of the two men; but Chapman had Abernethy's humor, without a tinge of his coarseness and causticity.

Edinburgh, however, was at this time the medical metropolis of the world; and, in 1801, Chapman went there for a sojourn of two years. The influence which the Edinburgh medical school had long exerted over the profession of America is forcibly described by Dr. Jackson in his Discourse commemorative of Dr. Chapman. "The celebrity it had acquired from its Monros, Cullen, Brown, and Gregory, had not been eclipsed by the Paris or German schools, or rivalled by those of London or Dublin. The medical school of the Scotch metropolis was the cynosure of American physicians during the colonial period, and continued to be so until within the last twenty-five years. Most of the eminent medical men of Philadelphia, New York, and Boston, of the latter part of the last century, were its alumni. I doubt whether, at that time, more was known of the European continental schools than the mere existence of two or three of repute. All of the medical doctrines, ideas, principles, and practice of this country were derived from the Edinburgh school, or from English writers. Our knowledge of the works, contributions to science, doctrines, theories, and practice of the French, German, and Italian medical schools and profession, with some very limited individual exceptions, does not date beyond twenty-five or thirty years."

The great ornament of the Edinburgh school, Cullen, had been, at this time, some years dead. But his teachings survived, and, indeed, pervaded not only the British isles, but the North American continent. Nowhere were they more implicitly received than in our own country. The lectures of Kuhn, who a short time before had occupied the chair of Theory and Practice in the University of Pennsylvania, are described by Caldwell as "strikingly characterized by the doctrines and notions of Cullen, and not a few of them actual copies of his lectures." And "Cullen's First Lines," down to a period within the recollection of many of our older physicians, was the time-honored text-book of the Practice of Medicine in the United States.

The doctrines of Cullen, which are to a certain extent founded upon those of Hoffman, had effected a revolution in medical theories. They superseded the *humoral* pathology of Boerhaave, and based diseased action solely upon derangement of the *solid* organs of the body. The system of Cullen, afterwards rudely simplified by Brown, and again modified by Rush, retained its hold over the

British and American *mens medica*, until the comparatively recent discoveries of chemical analysis revived the old humoral opinions, so consonant with the instincts of mankind. Chapman carried away with him for life the doctrines of the Edinburgh school. He was, to the close of his medical career, in the language of Dr. Jackson, "a most uncompromising vitalist and solidist."

His residence in Edinburgh was agreeable as well as instructive. His pleasant manners and social powers brought him into intimacy with a number of distinguished men, particularly Lord Buchan, Dugald Stewart, and Brougham. He seems to have anticipated the career of Brougham; for, not long after his return to the United States, he republished Brougham's speech before the House of Commons on the British Orders in Council, with a biographical sketch, in which the eminence of the future chancellor was predicted.

Lord Buchan, the eccentric but warm-hearted friend of America and Americans, paid the young Virginian the compliment of a public breakfast, upon his departure for his own country. The occasion selected was the birthday of Washington, and a large number of distinguished persons, including most of the literary celebrities of the modern Athens and many of the nobility, male and female, were present. Lord Buchan, at the close of this entertainment, committed to the custody of his young friend an interesting relic, valuable from a double historical association. He had, some years previously, presented to General Washington a box made from the oak that sheltered Wallace after the battle of Falkirk, with a request to pass it at his death to the man in his country who should appear to merit it best. General Washington, declining so invidious a designation, returned it by will to the Earl, who intrusted it to Dr. Chapman, with a view to its being ultimately placed in the cabinet of the College at Washington, to which General Washington had made a bequest.

Upon his return to the United States, Chapman determined to select Philadelphia as the theatre of his professional career. An offer of partnership in Virginia had been made to him by his old preceptor, Weems. But he chose the wider field, and in 1804 commenced the labors of his profession in Philadelphia. His success was immediate; and for a period of nearly fifty years he commanded whatever he could attend of practice in the most refined and opulent circles of our city.

As a practitioner, his qualifications were unrivalled. The charm of his manner was no less effective in the sick-chamber than his skill

in distinguishing and relieving disease. His lively conversation and ever-ready joke were often more soothing than anodyne or cordial; and when roused by urgent symptoms, he was unequalled in resources, as he was devoted in attentions. As a consulting physician, his great powers were particularly conspicuous. Rapid and clear in diagnosis, inexhaustible in therapeutics, self-relying, never discouraged, never "giving up the ship," he was the physician of physicians for an emergency.

At the bedside, Chapman dismissed speculative theories of morbid action. His remedies were drawn from observation and experience; and no man wielded more dexterously and successfully the known resources of his time. In our day, a less depressing therapeutics has come into fashion, and the means of combating disease are doubtless more numerous than were in Chapman's hands. But,

> "Take him for all in all,
> We shall not look upon his like again."

He was singularly indifferent to the emoluments of his profession. Careless in his accounts, resolute in refusing bills to his numerous family connections and personal friends, always moderate in his charges, he realized scarcely a tithe of the receipts which some of his successors in fashionable practice have rolled up. No more generous and less covetous man ever lived.

Public teaching early attracted Chapman's aspirations. Very soon after his return from Europe he gave a private course on Obstetrics, a branch which had then merely a nominal place in the lectures at the University. His success led, in 1807–8, to a connection with James, already known as a teacher of obstetrics. In 1810, the Professorship of Midwifery in the University was conferred upon James, with an understanding that he should be assisted by Chapman. His introduction into the University was now fixed; but an independent chair was not placed within his reach until, in 1813, the death of Rush occasioned a rearrangement of the school.

Barton, who had long filled the chair of Materia Medica with distinguished éclat, was induced to exchange it for that of the Theory and Practice; and the former chair, thus made vacant, was conferred upon Chapman.

The transfer of Barton to a department which was congenial neither to his taste nor studies, could scarcely have promoted the interests of the University, or his own reputation. His health, too, proved

unequal to the new demand upon his mental exertions; and the hereditary gout, to which he had long been a martyr, aggravated into hydrothorax, in less than three years terminated his life.

During the brief period in which Chapman occupied the chair of Materia Medica, his courses were eminently satisfactory to his classes. Dr. Jackson considers them "an advance on those of his predecessor," and Caldwell bears strong testimony to his success.

His lectures were afterwards embodied in his "Elements of Therapeutics and Materia Medica," a work justly pronounced by Dr. Jackson to have been "the best treatise in the English language on those subjects at the time of its publication."

In this work, the articles of the Materia Medica are treated in their character as remedial agents, and with chief reference to their employment in the treatment of diseases,—a method afterwards adopted by many of the French writers, especially by Trousseau and Pidoux, in their brilliant Treatise on Therapeutics.

Chapman's Therapeutics is an original work—original in its plan, original in its execution. As a text-book, it is of course superseded by later publications; but the American student will do well not to "lay it on the shelf." The chapter on *Emetics* will never be obsolete.

The *solidist* doctrines of the day were adopted by Chapman in explanation of the *modus operandi* of medicines. Their absorption into the blood had scarcely yet been demonstrated by physiology; and the principle of SYMPATHY, which he employed to account for morbid action, he applied also to the explanation of medicinal impressions. But, with singular candor, when Magendie's experiments on the absorption of medicines were announced, Chapman "engaged Drs. Coates, Lawrence, and Harlan, to repeat them at his expense;" and, upon their confirmation, although he made no public recantation of his views, he would never permit the publication of another edition of his work.

It had already gone through seven editions, one of them surreptitious; and "when still in great demand, the author refused to have it reprinted, because he thought it required a thorough revision."*

The great event of Chapman's life was his appointment, in 1816, to the Chair of the Theory and Practice of Medicine and Clinical Medicine, in the University of Pennsylvania. He filled it for more

* Manuscript letter of Dr. Chapman.

than a third of a century, with distinguished success; and left it with a national reputation.

His lectures were enriched with varied erudition; in style forcible and terse. His medical opinions, accordant in the main with the approved dogma of his time, were in much original. His practical precepts were judicious and impressive.

As a lecturer, he is well portrayed by his colleague, Dr. Jackson, "as self-possessed, deliberate, and emphatic. Whenever warmed with his subject, his animation became oratorical. Often the tedium of dry matter would be enlivened by some stroke of wit, a happy pun, an anecdote, or quotation. He was furnished with stores of facts and cases, drawn from his own large experience and observation, illustrating principles, disease, or treatment, under discussion. His bearing was dignified, his manner was easy, and his gestures were graceful. He had a thorough command over the attention of his class, with whom he always possessed an unbounded popularity. His voice had a peculiar intonation, depending on some defect in the conformation of the palate, that rendered the articulation of certain sounds an effort. The first time he was heard, the ear experienced difficulty in distinguishing his words. This was of short duration; for once accustomed to the tone, his enunciation was remarkable for its distinctness. Students would often take notes of his lectures nearly verbatim."*

Chapman's leading Theory of Medicine was comprised in the great principle, SYMPATHY. His predecessor, Rush, refining on the *solidism* of the Scotch school, had reduced all diseases to a unit,—considering them to be mere expressions of different states of excitability and degrees of excitement. Chapman "recognized the differences in the vital endowments of the tissues and organs, and the diversities of pathological conditions." He restored the classification of diseases which Rush had discarded. Adopting the prevailing *anti-humoral* views, he refused, however, to deny the obvious and well-defined varieties in the manifestations of disease; and skilfully expanded his theories to include them.

In his teachings, exclusive contemporaneous dogmata were enlarged and generalized; and his practical tact never permitted them to lead him to unsound therapeutical deductions.

His scheme of therapeutics stands the test of time. It is essen-

* Dr. Jackson's Discourse.

tially the same as was taught by his distinguished successor,—modified, indeed, by the discoveries of modern chemistry, but in the main unshaken by physiological and pathological revolutions.

In the spring of 1850, the decline of health and physical powers led Dr. Chapman to abandon the field of labor which he had so long and brilliantly occupied. He resigned his chair, and withdrew from practice and society. For three years, he survived, in the seclusion of his family; slowly and almost imperceptibly, without apparent disease, by gentle and gradual decay, passing to the other world. His death took place on the 1st of July, 1853.

The highest complimentary distinctions, which his professional brethren could accord, had been paid Dr. Chapman. He was for many years President of the Philadelphia Medical Society; and was by acclamation, in 1848, elected first President of the American Medical Association. Many medical and learned societies of Europe also enrolled him among their members.

At the time of his death, Dr. Chapman was one of the senior members of this Society, to which he was elected on the 17th of April, 1807.

In 1846, he was elected to the Presidency of the Society. He held it three years, declining a re-election in 1849.

In addition to his courses at the University, Chapman, for a long period, gave clinical lectures in the hospital of the Philadelphia Almshouse. He, moreover, for upwards of twenty years, delivered a summer course of lectures in the Medical Institute of which he was the founder.

Chapman's personal popularity was not inferior to his professional position. His temperament was cast in the happiest mould. Social in disposition, with an unfailing gaiety of spirit, a wit—a punster—delightful as a companion, and enjoying company, he, for a generation, occupied a position unrivalled in the society of Philadelphia. To these brilliant qualities, he united the kindliest feelings and the gentlest temper. He was utterly without malice; frank, open-hearted, and open-handed.

His jokes and puns are familiar in our Philadelphia ears as household words; and those who enjoyed the charm of his society will not soon forget his cordial, blithesome manner, and his bright, cheery look.

Dr. Chapman's published writings are numerous. His "Therapeutics" has been alluded to. Many of his lectures appeared in the "Medical Examiner" of Philadelphia, in the years 1838, 1839, and

1840, and were afterwards republished, with others, in separate form. The published lectures comprise the following subjects, viz.: Eruptive Fevers, Diseases of the Thoracic Viscera, Fevers, Dropsy, Gout, and Rheumatism. A Compendium of his Lectures was also published by Dr. N. D. Benedict.

In 1820, Dr. Chapman commenced the publication of "The Philadelphia Journal of the Medical and Physical Sciences," which he continued to edit for many years. This Journal, continued to the present day, under the name of "The American Journal of the Medical Sciences," is now well known throughout Europe and America as the oldest and first of American medical journals.

In 1808, Chapman published a work entitled "Select Speeches, Forensic and Parliamentary," with critical and illustrative remarks, in five 8vo. volumes, which excited much attention.

In 1804, Dr. Chapman contracted a matrimonial alliance, from which he derived unalloyed happiness. His wife, Rebecca Biddle, (daughter of Colonel Clement Biddle, of the Revolutionary Army, an intimate friend and confidential correspondent of Washington's), still survives him.

The decease of Major John Le Conte, a member of the Society, at Philadelphia, on the 21st of November, 1860, aged 77, was announced by Dr. Coates, with a brief sketch of his life. Mr. Foulke also paid a deserved tribute to the learning and virtues of the deceased, of whom, on motion of Dr. Elwyn, Dr. Coates was appointed to prepare an obituary notice.

Judge Carleton made a verbal communication upon the subject of the Association of Ideas, in continuation of remarks at a former meeting. Mr. Foulke and Dr. Bell carried on the discussion of the subject.

The annual report of the Treasurer was read and referred to the Committee of Finance.

The annual report of the Publication Committee was read by Dr. Caspar Wister.

Pending nomination, No. 416, was read, and the Society adjourned.

Stated Meeting, December 21, 1860.

Present, twenty-two members.

Prof. Cresson, Vice-President, in the Chair.

A letter was read from W. H. Harvey, dated Dublin, December 6, 1860, accepting membership.

A letter was read from Dr. Casper Morris, dated Philadelphia, December 18, 1860, resigning membership.

Letters acknowledging the receipt of the Society's publications were read from the Lusatian Society at Görlitz, dated September 14; the Royal Academy at Amsterdam, dated March 24; the Royal Society of Antiquaries, and M. C. C. Rafn, at Copenhagen, dated October 15, 1860.

Letters announcing donations were read from the Royal Society of Antiquaries at Copenhagen, dated October 15; the Lusatian Society at Görlitz, dated September 15, and the Royal Academy at Amsterdam, dated August 15, 1860.

A circular letter was read from C. St. A. Bille, dated Copenhagen, September 17, 1860, explaining the appearance of a series of articles in French in the columns of his paper, the "Dagbladet," on the subject of the Schleswig-Holstein difficulties, with two specimen sheets of the paper.

A letter was read from C. C. Rafn, of Copenhagen, dated October 18, 1860, detailing the publications of the Royal Society of Antiquaries of the North.

A letter was read from H. Wheatland, secretary of the Essex Institute, dated Salem, Massachusetts, December 17, 1860, announcing a donation, and requesting a set of the Proceedings for the library of the Institute. On motion, the request was granted.

A letter was read from the president, Dr. Wood, dated London, November 29, and Paris, December 1, 1860, informing the librarian of the measures he had taken to forward their diplomas to foreign members lately elected, and to obtain sets of the publications of the Geological and Ordnance Surveys of Great Britain and France. The secretaries were

authorized to make application to the French authorities for the publication of the French Survey. And so much of the letter as related to certain parts of the British series was referred, on motion of Dr. Bache, to a committee of three, consisting of Mr. Lesley, Mr. Trego, and Mr. Foulke.

A letter was read from Matthew S. Henry, dated Philadelphia, December 20, 1860, offering for sale at not less than $100, a MS. vocabulary of the Delaware Indian Languages. The volume (of 800 pages) was exhibited, and the application of the author was, on motion, referred to a committee of three, to be appointed by the president, and announced at the next meeting. The president appointed Dr. B. H. Coates, Mr. Lesley, and Mr. Foulke.

The following donations for the library, were announced:

R. S. N. Antiq. Copenhagen, extract from statutes, list, &c. 4, 16, 12 pp. 1860.—*From the Society.*

Runeindskrift i Piræus; interpretée par C. C. Rafn (pp. 250). 1860. Copenhagen. 8vo.—*From the same Society.*

Jaarboek van de K. Akad. van W. te Amsterdam. 1859. 8vo.

Verslagen en Mededeelengen. Afd. Lett. vijfde deel.

Afd. Nat. tiende deel. Amsterdam. 1860. 8vo.

Catalogus van de bœkerij der K. A. I. 2. Amst. 1860. 8vo.

Verslag over den Paalworm, pp. 150. Amst. 1860. 8vo.

Neues Lausitz. Mag. XXXVII, i, ii, pp. 500. Görlitz. 1860. 8vo.

Quar. Jour. Chem. Soc. London, LI. 1860. 8vo.—*From the Society.*

Proc. Royal Soc. London, X. No. 39. 8vo.—*From the Society.*

Proc. S. Ant. London, IV, iii-lii; 1, i, 2d Ser. Nov. 17.—Dec. 22, 1859.—List of members for 1859 and 1860.—

Archæologia, XXXIII. 1860. 4to.—*From the Society.*

Proc. B. N. S. H. VII (23, 24). 1860. 8vo.—*From the Society.*

Cambridge Ass. Jour., No. 142.—*From the Editor.*

Proc. Acad. N. S. Philadelphia (33), 1860. 8vo.—*From the Acad.*

Journal Franklin Inst. No. 420. Philadelphia. 8vo.—*From the Inst.*

Patent Office Report, for 1859. Wash. 8vo.—*From the Bureau.*

Smithsonian Inst. R. for 1859. 8vo.—Smith. Misc. Contributions:—

Cat. of described Lepidoptera of N. A. J. G. Morris. 1860. 8vo.

Cat. of described Diptera of N. Amer. R. Ostensacken. 1860. 8vo.

Cat. of Publications of Societies, and other Periodical Works in the Lib. of S. I. July 1, 1858. Foreign Works. Wash. 1859.

African Repository. December, 1860.—*From A. Col. Society.*
Desc. of Bond's Isodynamic Escapement. Boston. 1860. pp. 4.
Lunar tidal Wave in Lake Michigan. J. D. Graham. 1860. pp. 7.

Dr. Bache read a circular letter of the relatives of M. Steen Anderson de Bille, a member of the Society, and formerly Chargé d'Affaires of Denmark, near the United States government, announcing his decease, at Bruxelles, November 28, 1860, at the age of 79. Dr. Bache and Dr. Hays described the virtues and attainments of the deceased; and, on motion of Dr. Leidy, Dr. Bache was appointed to prepare an obituary notice.

Mr. Franklin Peale exhibited a numerous collection of Indian arrow-heads, flint-knives, and pottery, with the following remarks:

The members of the Society are aware, from the proceedings of the various learned societies, which have been laid before them, and particularly from the establishment of an institution with express reference to the subject, which was placed upon the list of our correspondents at the last meeting, that much attention is now given to the works of Man, found with the remains of extinct animals, in Diluvial deposits and in Bone caves.

It is not my intention to enter into an investigation of this branch of research, as our resources are much too meagre at this time; but I solicit the indulgence of the Society, in behalf of a few remarks upon a department of Ethnology that, I cannot help observing, has been too much neglected in this country.

The learned Conservator of the Museum of Copenhagen, so rich in Scandinavian Antiquities, several English Philosophers, including Messrs. Lyell and Prestwick, have recognized the term "Stone Period of the Human Race," as that condition in which the art of working metal was unknown; followed by the "Bronze Period," that in which rude art fashioned the alloys of copper into weapons of war and utility; and ending with the "Iron Period," the last, that in which the working of iron, and its conversion into steel, brings us to the summit of our career in Arts, Sciences, and their congeners, Literature and the Fine Arts.

Retracing this order, it is not necessary to pause upon the latter period, but proceed at once to state, that in the territory of the United States the Bronze Period may be said to have scarcely had

an existence. It is true, that various articles have been found, made of copper, usually taken from the Mounds, even as far south as Florida, but which, it is almost certain, had their origin in the deposits of native copper of the Lake Superior region; where rude excavations and stone implements give frequent and reliable evidence of the source from whence such articles, and they are comparatively rare, have been derived.

But the Stone Period of the inhabitants of our portion of the Continent is rich beyond all precedent, as far as we are able to judge, in specimens, scattered over the whole face of the country, but recent in date for, they were left by the "Red Man," whose fate it has been to pass out of existence before the path of the White Invader, leaving only his traditions, and these evidences of his hard, but inevitable destiny.

Is it not singular, that, in all ages and in nearly all portions of the world, the same means, in this rude state of existence, should be employed by Man to supply his wants? From it, we may draw conclusions that, in the words of Dr. Davis, the author of "Crania Britannica," when discussing the subject in connection with the Egyptians and Ancient Britons, "plead for the unity of the human race much more powerfully and more rationally than the metaphysical arguments, with which the doctrine is usually sustained." "It shows that man, in the same state, is everywhere the same; so much so, that the selfsame simple ornaments, produced by the selfsame instruments or the same materials, are to be seen everywhere alike. Nay, we may go further than this even, and show that the same instrument is made everywhere by the same number of strokes, given in exactly the same direction. There must, therefore, have been the same wants, the same powers and capabilities, the same skill, and actually the same taste or the same desire for the beautiful, with exactly the same means of gratifying it."

In a preceding paragraph are the words "but of recent date:" this expression is used for reasons that will appear in the course of this communication, for there are Tribes still living on this Continent who use stone implements, because the white trader has not yet supplied them with the metal which supersedes its use; and some of the specimens, which are herewith submitted to the inspection of the Society, were derived from Tribes that have given way recently to the gold-seeking pioneers of California. These facts bring us to the immediate object of this communication, which is, to point out

the close similitude of the specimens selected from my cabinet, and laid before the Society, with the figures of "Prominent forms of flint implements found in the Valley of the Somme," at Amiens and Abbeville, described in the proceedings of the Literary and Philosophical Society of Liverpool, in a communication by Henry Duckworth, F. R. G. S., &c. They are so much alike, that they may almost be viewed as the identical specimens from which the artist made his designs.

There is no reason to mistrust the authenticity of the source from whence the figured specimens were derived, and that they were the works of man's hand, no one at all conversant with the subject can for a moment doubt; the general form and conchoidal fracture leave no room for error; and the presence of bones of the extinct animals associated with them in undisturbed diluvium, and in bone caves, is well established.

The conclusions from these accepted facts of association of the bones of the elephant, rhinoceros, cave bear, hyena, and other extinct animals, with flint knives, arrow-heads, and other "worked flints," of man's making, do not involve any necessity of an earlier or more remote origin of our race, than is usually received as orthodox, but evidently brings the existence of these animals down to a later and contemporaneous period.

M. Boucher de Perthes, is unquestionably the pioneer in this research; but he is an enthusiast in his science, and some of the figures in his first volume, if faithful, will require a like temperament to see, as he saw; or more correctly, perhaps, be it said, as his engraver desires the observer to see.

The forms of the specimens submitted to the inspection of the Society are well-nigh identical, as are those of various other specimens from my cabinet, with those from Amiens and Abbeville.

We do not know with certainty what the material of the French and English specimens is, but have reason to believe that they were made of flint, as the prevalence of that mineral and the proximity of chalk account alike for its origin and abundance. They are undoubtedly, like those of this country, composed of a silicious base. Ours, likewise, are of horn-stone, jasper, &c., and all the varieties of transition from simple sandstone to pure chalcedony: But here all similitude ceases; these are taken from the surface of the earth, emphatically from the soil, or turned up by the plough, which had, on some former furrow-trod path, turned them under it; or they were found on the borders of our rivers, the caving banks of

which, by the freshet's flow, have been washed away, leaving the heavier stone implements at rest among the pebbles and sand of their shores.

What their age is no man can tell; but we do know that their use gave way to the advent of the white man; some of them undoubtedly buried or abandoned, like the tomahawk of war on the approach of the peaceful Penn and the benevolent founders of our State.

With regard to the use of the implements under immediate consideration we are left entirely to conjecture. They have not the pointed or lance form of the true spear-head, of which there are abundant specimens (a few are laid upon the table); but have an oval form, frequently without sharp edges, and have been distinguished by the term, "almond-shaped implements." That they were "sling-stones," as some have supposed, is much less probable than that they were inserted, in rows, into wooden handles or staffs, like certain ancient weapons of war,—the beak of the saw-fish, or the shark's tooth, offensive weapons of the South Pacific islanders of the present day.

In connection with this subject, the attention of the Society is solicited to the interesting fact, that during the Stone Period the manufacture of pottery was simultaneously practised, in a rude state it is true, but sufficiently perfect to answer most of the needs of a savage existence, with attempts at ornament, and in some instances graceful forms, that show an effort for the beautiful. A band frequently surrounds the brim, occasionally turned over, although they were sometimes moulded without this ornamental form; for the makers of these utensils, like the makers of arrow-heads, had different degrees of excellence in their art, and exhibit as striking differences in correctness of eye and neatness of hand, as we see, in this our day, of skilful workmen, and the botched jobs of apprentices who have mistaken their calling.

The attempts at the ornamental decoration of pottery are frequently, if not invariably, exhibited in diagonal lines, alternating at intervals, and parallel lines, and dots; the first reminding us of the rude attempts, with a like object, in certain early samples of Saxon architecture. There is also exhibited a graining of the surface, evidently made by or with the "cob," from which the Indian corn has been removed.

These pots were round on the bottom, plain, and without legs.

The material is clay, in a crude state, nothing but the stones

being removed; sand and other impurities were neglected, and they are entirely unglazed.

They were baked by the application of fire to the interior, of sufficient force to render the fragments, which are so abundant, imperishable by time or exposure.

A similar condition of art, under similar circumstances, is strikingly exemplified by fragmental specimens of pottery of the Ancient Irish. The specimens of that art laid upon the table, were taken from a "clough" or mound in County Down, Ireland, which was opened in the present year.

These specimens show a ruder condition of art, and are ornamented by diagonal lines, also ruder than in the American specimens; but the material, both in treatment and composition, is similar, and like them, were burnt by application of fire to the interior.

As a closing remark, the condition of the arts, as exemplified by the relics of the Stone Period, and the pottery which accompanied it, are strikingly similar, wherever and whenever that condition existed. The rude Ancient Briton, the early Scandinavian, fashioned these implements as the savage of this day fashions them, and doubtless supplied his wants, and gave expression to his aspirations by the same rude means.

Professor Trego considered the unsymmetrical and almond-shaped specimens as merely unfinished or half-formed arrow-heads and knives, and described rocks of red jasper near Easton, at the base of which a manufactory of implements existed in Indian times, immense numbers of perfect and imperfect specimens remaining to the present day. Mr. Foulke drew the attention of members to a recent article, written by a learned member of this Society, in "Blackwood's Magazine," giving his opinion of the antiquity of the remains found in the Valley of the Somme. Mr. Peale alluded particularly to a specimen, placed by virtue of its material among a group of chalcedonic lance-heads collected from the region beyond the Mississippi, which was picked up upon the banks of the Schuylkill. As that material cannot be obtained in Pennsylvania the fact stands in evidence of the wide range of Indian trade in articles of warfare. Dr. Coates illustrated the use of the weapons from archæological history; and, from a comparison of the pic-

ture-writing of the Mexicans with the identical but ruder ornamentation of buffalo robes and tent covers in the Valley of the Upper Missouri, and from other things, deduced his opinion that the developement of art and civilization may be traced from the north southward. Mr. Peale, in reply to questions, described the characteristic "pecking" process by which the best Celts found were prepared for the polishing process and final perfection.

The annual report of the Finance Committee was read and its recommendations in regard to the official bonds of the late and present treasurer were adopted by the Society. The appropriations recommended for the ensuing year were ordered to be made, viz.:

For Journals,	$50
Hall,	100
Binding,	50
Publications, in addition to the interest on Publication Fund,	500
General account,	1760
Total,	$2460

Pending nomination No. 416 and new nomination No. 417 were read.

Mr. Justice tendered his resignation as a member of Council, which was accepted.

On motion of Dr. Bache Dr. Morris's resignation was accepted.

And the Society adjourned.

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ERRATA.

Page 53. Line 2 from bottom. For "4th and 12th" read "12th and 15th."

Page 379. In Table 1, opposite to $0h.$ $30m.$ after the moon's meridian passage, or time of lunar mean high water. For "0·140 of a foot" read "0·146 of a foot."

Page 381. Line 9. For "period" read "periods."

Errata in No. 60 (*Vol. VI.*), *and No.* 61 (*Vol. VII.*), *of the Proceedings of the American Philosophical Society.*

No. 60, (Vol. VI.)

Page.	Line from top.	CORRECTIONS.
348	31	For "practi*cal* observer," *read*, practi*sed* observer.
350	13	After "Minoris)" *add the word*, north.
364	40	At the end of the fourth line from the bottom: for "0*h.* 02*m.* 53*s.*76," *read*, 0*h.* 02*m.* 53*s.*763.
369	10	For "00*s.*03," *read*, 0*s.*003.
372	6	At the end of this line: for "+ 0*s.*251," *read*, + 0*s.*256.
379	14	After the word "day," place a comma.
„	„	After "(July 3d.)" erase the semicolon, and substitute a comma in its stead.
387	8	At the end of this line: for "104*m.* 42*s.*16," *read*, 4*m.* 42*s.*16.

Page.	Line from top.	CORRECTIONS.
29	28	For "γ Leonis," *read*, γ' Leonis.
32	32	For "07," *read*, .07.
37	16	For "(at 12*h*. 34*m*.)" *read*, (at 12*h*. 24*m*.)
47	1	For "station," *read*, stations.
48	19	For "36*m*. 34*s*.04," *read*, 36*m*. 34*s*.4.
50	19	For "(at 20*h*. 86*m*. 38*s*.44, &c.)" *read*, (at 20*h*. 36*m*. 38*s*.44, &c.)
58	14	For "12*h*. 16*m*. 53*s*." in the second column from the left hand, *read*, 12*h*. 16*m*. 52*s*.
62	11	In the fourth column from the left, for "9*h*. 02*m*. 08*s*.24," *read*, 9*h*. 05*m*. 08*s*.24.
65	28	For "astronomidal," *read*, astronomical.
67	22	For "1851," *read*, 1858.
74	30	For "+ 8′ 30″," *read*, + 8′ 20″.
82	43	At end of bottom line, for "6*h*. 02*m*. 13*s*.03," *read*, 6*h*. 02*m*. 13*s*.30.
85	30	In the last line of the fourth column from the left: for "10*h*. &c.," *read*, 11*h*. &c.
85	44	In the second line from the bottom, and in the fourth column from the left; for "10*h*. &c." *read*, 11*h*. &c.
89	28	In the first or left hand column: for "11*h*. 22*m*. 10*s*." *read*, 11*h*. 22*m*. 00*s*.
95	8	For "(at 4*h*. 08*m*.)" *read*, (at 5*h*. 08*m*.)
109	35	For "(at 12*h*. 11*m*.)" *read*, (at 11*h*. 12*m*.)
118	10	For "4*m*. 43*s*.63," *read*, 4*m*. 44*s*.64.
„	44	Bottom line. For the sign — (minus), *read*, + (plus).
105	27	
106	5	
„	6	
„	34	Bottom line.
108	2	
„	3	
„	6	
115	22	
„	23	For "Capital," *read*, Capitol.
„	36	(Foot note.)
117	20	
„	21	
„	25	
119	2	
„	3	
„	11	

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